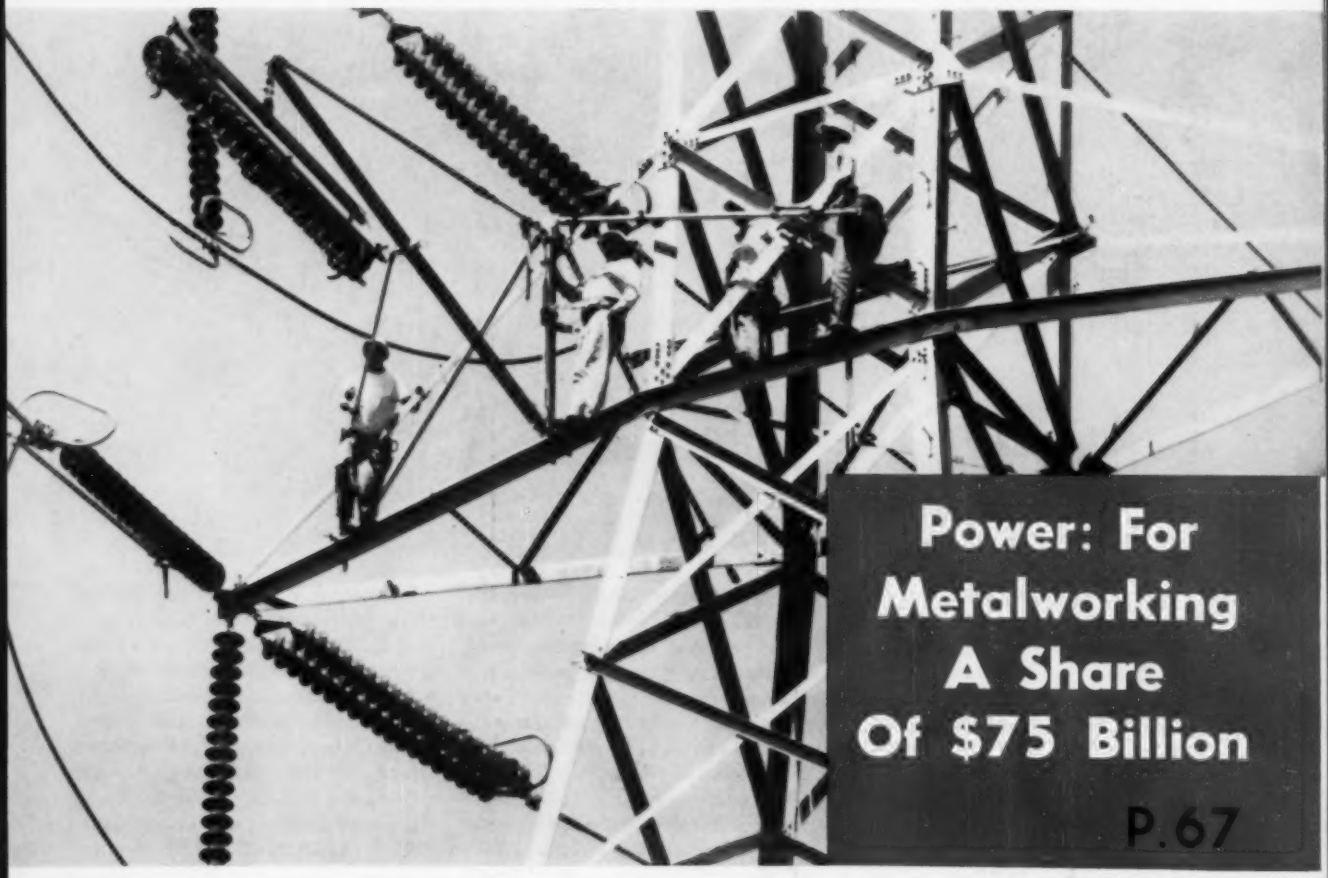
July 19, 1956

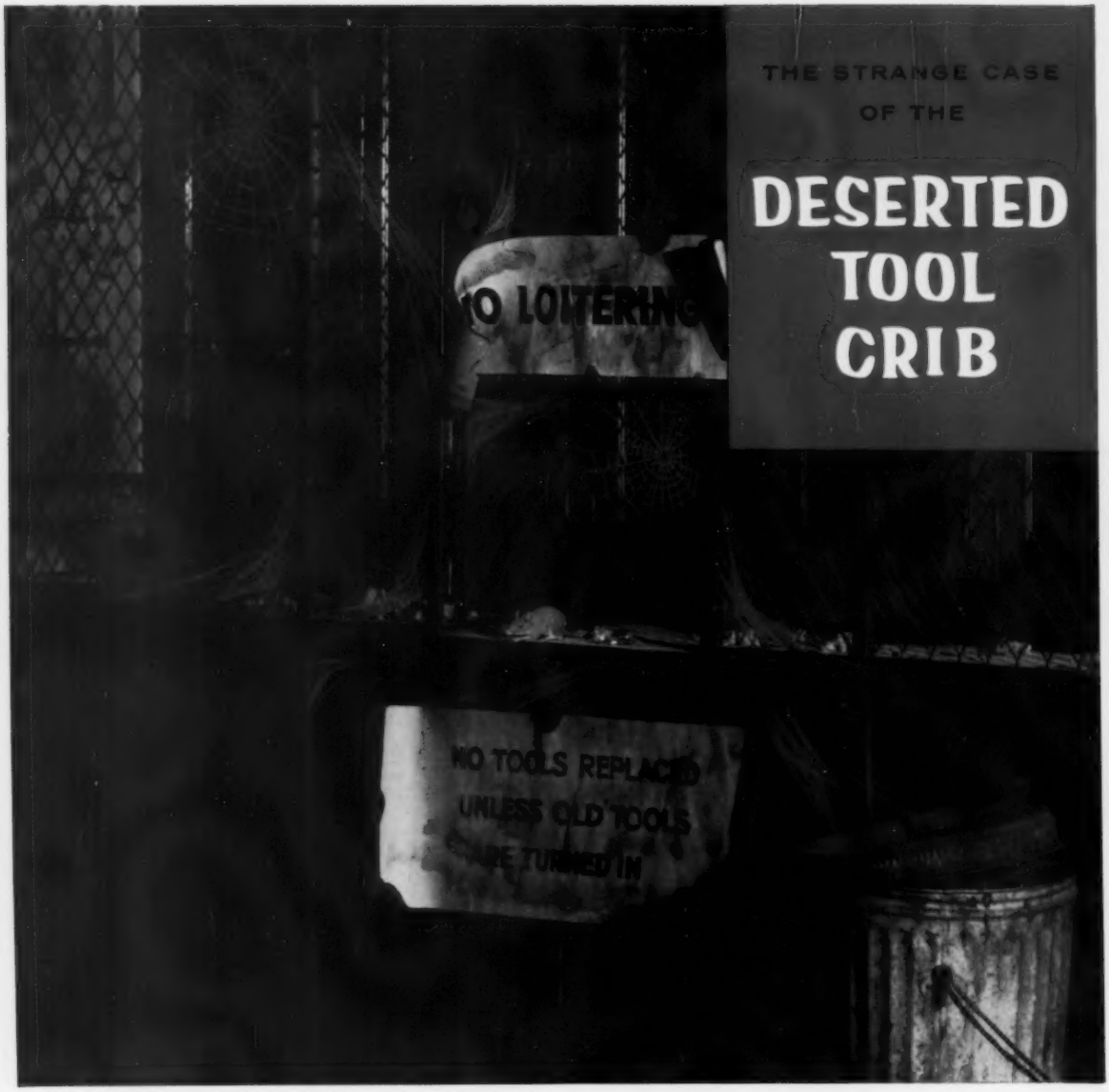
The IRON AGE

The National Metalworking Weekly



Power: For Metalworking A Share Of $75 Billion
P.67

How Steel Strike Hurts Construction P.70
Mass Marquenching Cuts Gear Distortion P.107
Digest of the Week P–2



Once upon a time there was a large manufacturing company that used so many small production tools that they had to operate two tool cribs. These were the busiest places in the whole shop. High-priced machinists spent so much time lined up to replace high-priced worn-out production tools that the personnel department put the coffee machines near the tool cribs. Then business began to fall off in the tool cribs. No more lines of high-priced machinists. As a matter of fact, one tool crib was all that was needed. Personnel department got worried because the income from the coffee machines was falling off. They decided to find out why one tool crib was deserted.

The answer was quite simple. The production department had started using Copperweld Leaded Alloys. Because of its extreme machinability, tools were just not wearing out the way they had been with unleaded steels. In some cases, tools were lasting as much as 10 times as long. The personnel department moved the coffee machine. The production profits from longer tool life, faster feeds and speeds attained with Copperweld Leaded Alloys, made it one of the most important things that had happened in that plant in years.

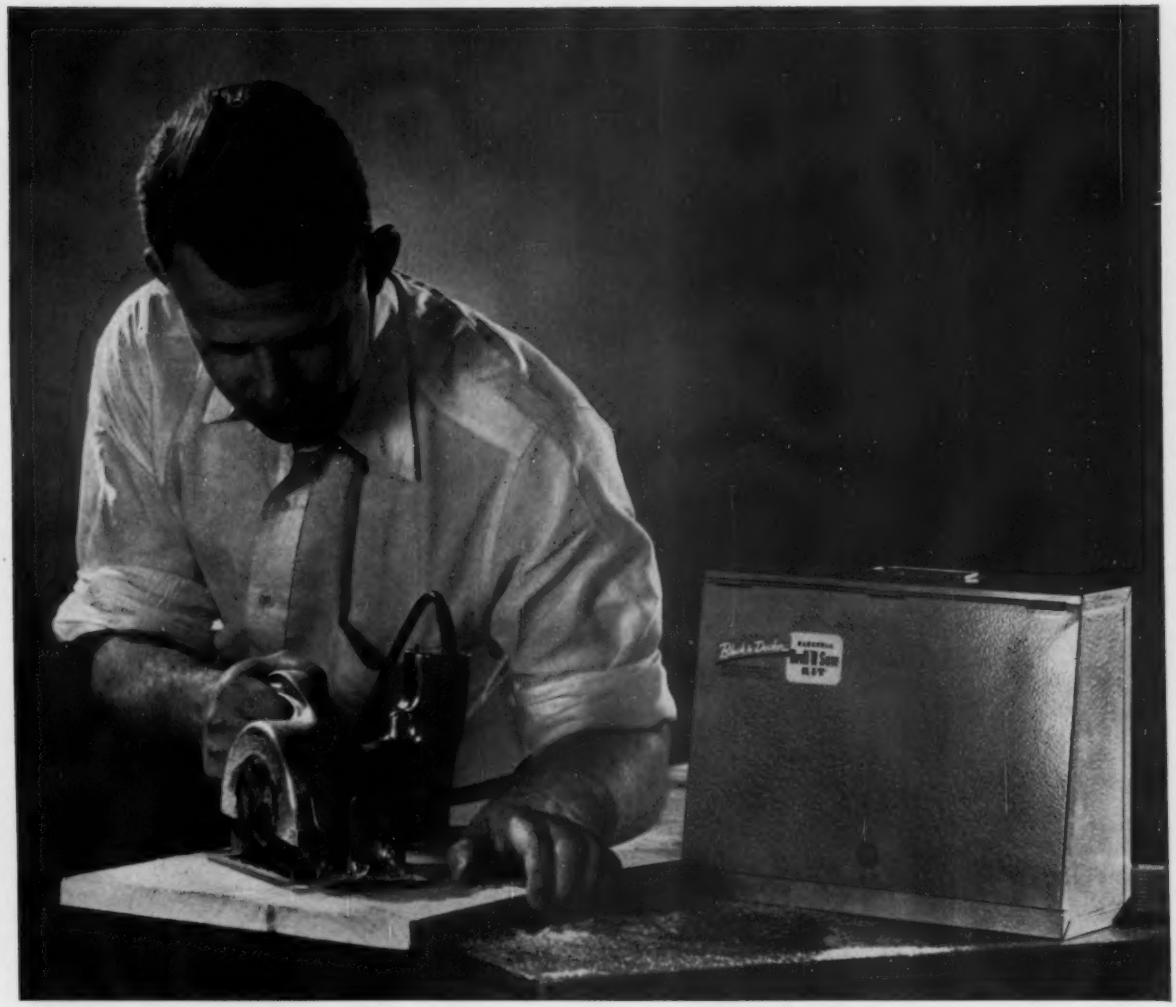
ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

Steel Division • Warren, Ohio

EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N.Y.

For further details on Copperweld Leaded Alloys, write for free booklet, "Lead Treated Steels."



He cuts quite a figure in the sheet steel picture too

You probably have at least one portable electric tool in your own home workshop; millions of Americans do. The growth of "do-it-yourself" is a modern phenomenon so well-known it scarcely needs elaboration here.

The great majority of these power tools are packaged in individual kit boxes—made of sheet steel. When you add up all the portable electric drills, sanders, circular saws and accessory kits that have moved across the counter in the last ten years, you arrive at a sheet steel requirement that runs into a considerable tonnage.

Bethlehem sheets are doing their share in this development, just as they are in numerous other applications which have vaulted ahead since World War II. Such items as television cabinets, air-conditioners, agricultural machinery, ironing boards and many others are making rapid growth, setting up steadily increasing demands for sheet steel.

At the same time, the longer-established users of sheets are making progress too. Bethlehem's job, of course, is to help satisfy these mounting demands for sheets. The job is a difficult one, but you may be sure we are sincerely trying to perform it in a manner that's fair to every one of our customers.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM SHEETS

BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

July 19, 1956—Vol. 178, No. 3

The IRON AGE

Digest of the Week in Metalworking

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THE IRON AGE, published every Thursday by CHILTON CO., Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

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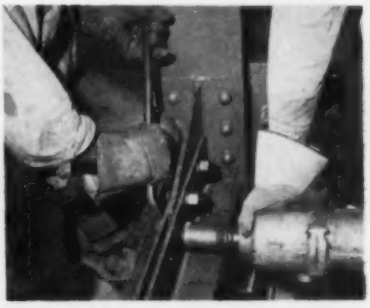
NEWS DEVELOPMENTS

STEEL STRIKE HITS CONSTRUCTION HARD P. 70

Construction boom threatened by steel shutdown. Shortage of structurals and plate aggravated. Fabricator backlogs are heavy and inventories low. Pre-strike mill cutbacks on deliveries and heavy carryovers hurt.

HIGH STRENGTH BOLTS SAVE CONSTRUCTION TIME P. 71

Now accounting for 15 pct of steel construction, high strength bolts are



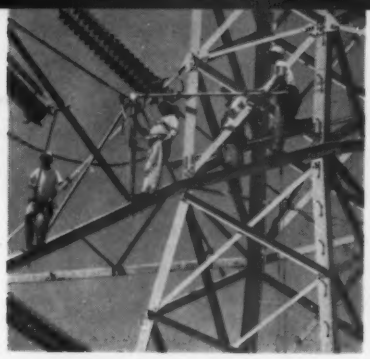
a big thing in building. Advantages include faster rate of construction, stronger joints, lower salvage costs, quieter construction.

STEEL STOCKS NOT AS HIGH AS THEY SEEM P. 73

Some experts are claiming that the steel strike is "good" for the country since inventories were heavy before the walkout. That's not the case. Imbalance is the fly in the steel inventory ointment.

SMOOTH SAILING AHEAD FOR TIN CONSUMERS P. 74

Production in 1956 will equal 1955. Output in 1957 will hold up, and price will have only minor fluctuations. That's what close followers of the tin markets say, and they give reasons.



ELECTRIC POWER COMPANIES will spend up to $75 billion in the next 20 years on new capacity and expansion. Multiplying use of electricity for home and industrial consumption will create new metalworking markets. Special Report starts on p. 67. (American Gas and Electric Co. photo.)

RAILROADS SEEK FREER RATE STRUCTURE P. 76

Administration's recommendations for changing ICC freight regulations are held aside until next Congress meets. Railroads, favoring the changes, say they are hampered in competition with truckers. Both sides recouping for second round. Some observers fear rate wars, nationalization of railroads.

FEATURE ARTICLES

REDUCE GEAR DISTORTION WITH MASS MARQUENCHING P.107

A new carburizing and heat treating installation combines maximum part quality with a minimum of distortion. Carburizing is achieved in a closely-controlled gas atmosphere for optimum carbon gradient. Mass marquenching produces distortion-free gears with improved toughness, wear resistance. Elimination of press and plug quenching reduces handling, helps cut costs.

NEW TOOL HONES BORES TO CLOSE TOLERANCES P. 110

Accuracy for roundness and straightness, low tool breakage, minimum machine downtime, faster production. These are some advantages of a new Chrysler-used honing tool. Removal of 0.003 in. of metal takes 20 to 25 seconds. Sizing is automatic. One tool hones 34 engine blocks per hour.

CLEANLINESS, FLOW CONTROL UP COOLANT EFFICIENCY P. 112

Among other things, modern machining requires efficient coolants. For maximum benefit, flow must be directed to the chip/tool interface. And fluids must be kept clean and at proper operating temperature. Coolant, cleaners, refrigerators, special flow-control devices are worthwhile aids to efficient low-cost machining, grinding. Most are highly versatile.

AUTOMATIC SETUP WELDS STRUCTURAL STEEL FAST P. 116

Faced with two giant fabricating problems, this shop tried joining with automatic submerged arc process. Results encouraged additional applications. Fabricating building columns from structural steel took 45 hours by hand, 8 hours on automatic equipment. Technique proved practical on wide-flange sections up to 60 ft long, at speeds of 20 ipm.

BRIGHT FUTURE FOR VACUUM INVESTMENT CASTINGS P. 120

Growing number of high-temperature applications demands unique alloys with top heat-resisting properties. Recent trend is to use high-strength parts wrought from vacuum-melted materials. Yet tests show that vacuum investment castings may sometimes be better. Furnace cost is problem.

MARKETS AND PRICES

ALUMINUM FOIL OFF ON NEW SALES BOOM P. 72

Shipments have doubled since 1952. No longer confined to kitchen, foil has made big strides in wrapping, now broadens uses. Competition forms with nine companies now in the race for the 300 million lb market.

SHOULD PURCHASING BE DECENTRALIZED? P. 75

Opinions are diverse on the superiority of consolidating or dispersing the buying function, a survey finds. Most firms usually seek a combination of the best features found in both systems.

DELAYED AUTO SALES SPURT LEVELING OFF P. 84

The seasonal surge in auto sales was late coming and might leave early. So far in July, new car business has held steady after increasing sharply since the end of May. Production for August will be 25 pct of Aug., 1955.

FAST TAX AID FOR STEEL IS IN THE WORKS P. 89

Government is getting ready to take a fresh look at the need for additional steel capacity. Road program, need for oil country and construction steel, prompt this second check. Steel price probe is moving slowly.

LABOR DIFFERENCES DEEP-SEATED AND SERIOUS P. 167

There is no quick-and-easy solution to the steel walkout. Both sides are adamant and fighting for a principle. Big difference this year is determination of steel firms to get long-term medium-cost contract.

NEXT WEEK:

ULTRASONICS: SOUND BREAKS METALWORKING BARRIERS

With a clutch of industrial tools and techniques already to its credit, ultrasonics is ready to open new process horizons . . . in heat treating joining, electroplating and casting, implementation hinges on design of full-scale industrial equipment.

(Curtiss-Wright Corp. Photo)

ONE OF A SERIES:

What makes a cylindrical roller bearing good?

RETAINERS

"requirement-engineered" for your kind of service

The basic parts of a roller bearing are the rollers, the races, and the *retainer* which locates and guides the rollers. There are significant differences in the design and construction of retainers, which influence bearing cost and performance. Some are simple and economical, well adapted for volume production; others are more costly but insure improved roller guidance, or cooler and smoother operation, or longer heavy-duty service. Here are the seven basic types in current use.

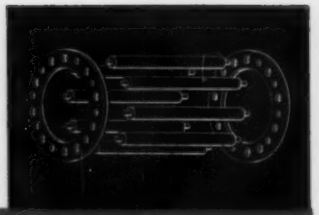
HYATT MAKES ALL SEVEN TYPES . . . EACH THE FINEST OF ITS KIND! You will find complete details in HYATT General Catalog No. 150, or your nearby HYATT Sales Engineer will gladly help you choose the type best suited to your requirements. Remember, HYATT is America's *first* and *foremost* maker of cylindrical roller bearings. Hyatt Bearings Division of General Motors, Harrison, New Jersey.

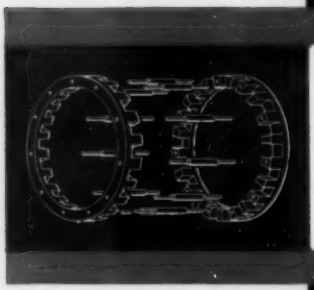
GM GENERAL MOTORS

HYATT

ROLLER BEARINGS

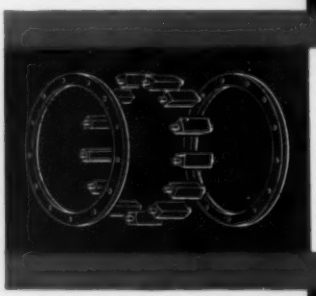
TRUNNIONED ROLLER CAGE—Economical for volume use on thin-annulus bearings. End rings are hardened steel stampings, connected by riveted bars interspersed between rollers to form an integral unit. Races can be omitted if desired.





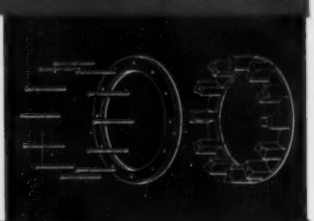
POCKETED END RING CAGE—Designed for fairly large bore bearings in heavy-duty service. Rollers are guided accurately by pockets drilled in bronze end rings. Riveted connecting bars form an integral unit, so races can be omitted if desired.

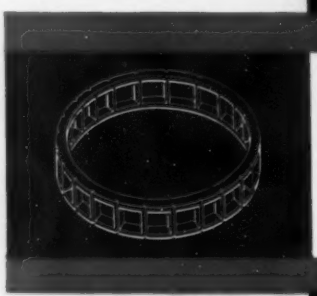
STAMPED STEEL SEPARATOR—Economical for volume use on wide range of bearings with short rollers. A single steel stamping with bars coined to conform to roller contour. Simple, open design assures large lubricant capacity and good circulation.



FORMED BAR CAGE—Well adapted for volume use on heavy-duty bearings. Hardened steel end rings are connected by cold-rolled shaped bars conforming to roller diameter. Insures quiet operation, better roller guidance, and the smooth surface of bars protects rollers.

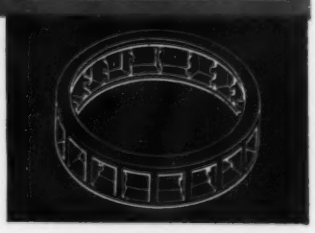
DRILLED POCKET CAGE—Used on better-grade bearings to provide extremely close control of rollers, which operate in pockets drilled and reamed in bronze cylinder. Riveted ring on one end retains rollers permanently, so races may be omitted if desired.



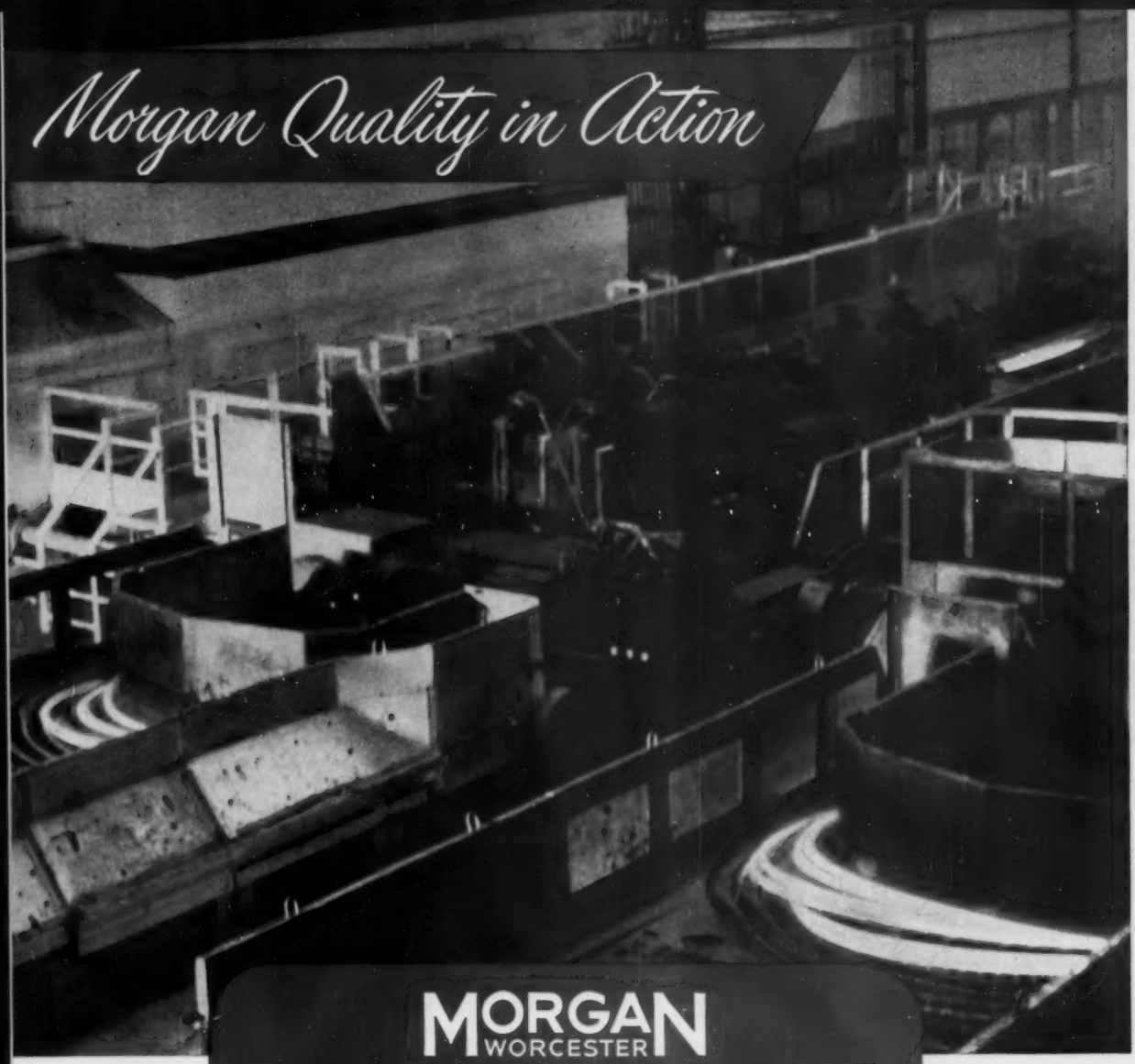


SEPARABLE BROACHED POCKET CAGE—Used only on finest high-speed bearings. An integral bronze cylinder with pockets broached for maximum uniformity. Insures minimum friction, better oil circulation for cooling. Rollers can be removed for inspection.

NON-SEPARABLE BROACHED POCKET CAGE—Similar to the above and offers all the same operating advantages. Used for "blind" installations where rollers must be retained with inner or outer race. Roller drop controlled by deforming bars after rollers are placed.



Morgan Quality in Action



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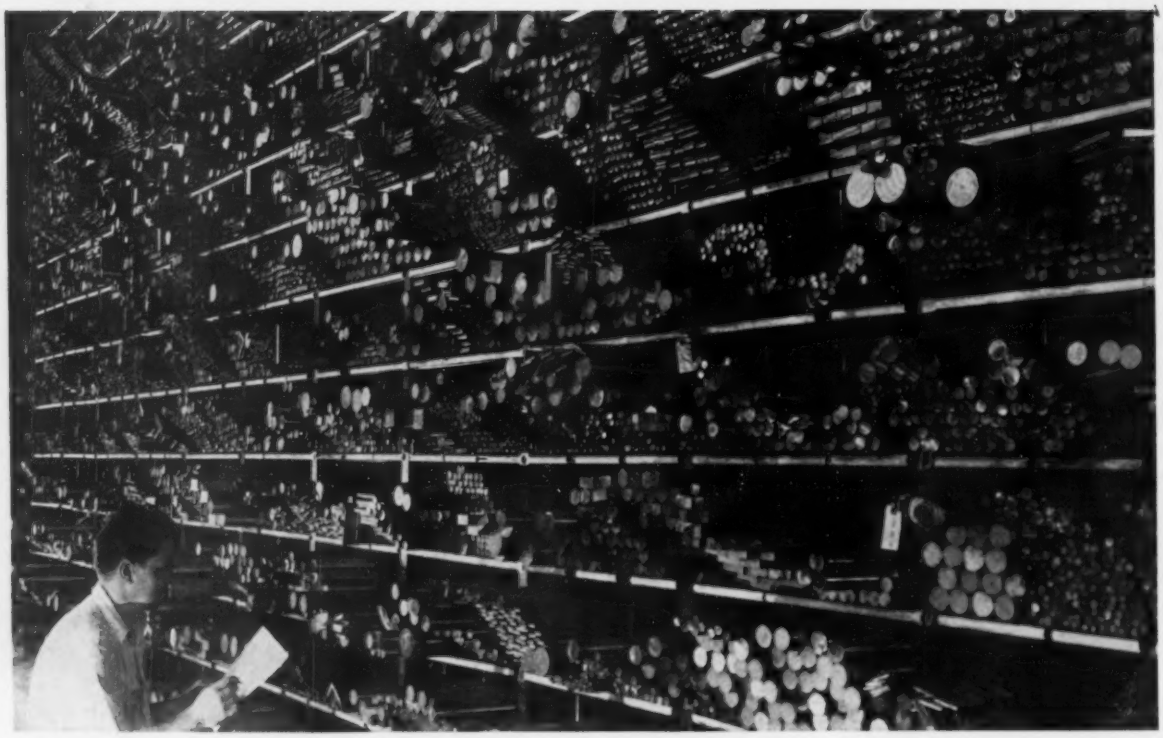

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17-7 PH

17-14 Cu Mo

17-10 P

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Here's how to get quick results when you need stainless steel bar or wire in *standard or special grades:* Just call your nearby Armco Stainless Steel Bar and Wire Distributor.

He'll rush your orders for standard shapes, sizes and grades from his complete stocks, which often include special Armco precipitation hardening grades (17-4 PH and 17-7 PH) and extra-low-carbon stainless. If these or other special Armco Stainless grades (such as 17-10 P or 17-14 Cu Mo) aren't on hand, he will get them for you promptly.

More to choose from

Now your Armco Distributor offers more grades and sizes to choose from than ever before. Newly expanded Armco mill facilities make it possible for him to stock a wider range of lengths, shapes, and sizes in stainless bar and wire.

What's more, his technical service costs you nothing. He will be happy to help you select the proper stainless grade, or supply you with specific literature from his complete library of Armco Stainless fabricating booklets.

If you don't know the Armco Distributor in your area, let us help you get acquainted with him. Just write and ask us for his name and address.

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Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

EDITORIAL

The Steel Industry's Dilemma

◆ THE STEEL INDUSTRY'S strong labor stand is not a reversion to jungle law. It is not a move to bust the union. And it is not an effort to weaken Dave McDonald's position in the steelworkers' union. None of these things will happen.

The number of responsible steel officials who saw a strike as an unwanted—and unnecessary—event is legion. Those who welcomed a strike were indulging in industrial frippery. But neither of these viewpoints could rule out a strike when basic principles are involved. That's what occurred this year.

No matter what the steel industry does in the labor area and no matter how high steel prices go, a certain degree of damnation is automatic. Had the Big Three steel firms settled for a big wage-fringe package quickly they would have been pilloried from coast to coast, including Washington.

They would have been accused of staking out a pattern-making, pace-setting wave of wage increases and fringe benefits. And they would have been roundly cursed for raising prices to an extent necessary to offset the wage bill and provide money for expansion.

Steel firms have been under far more bitter criticism from their customers than even they know about. Lack of capacity to take care of peak demand is a sore subject among some of the biggest and the smallest steel users. Expansion in fact and not in words must take place quickly. That takes money and stability.

Now that the strike has happened it brings criticism down upon the steel industry from Washington and from the public. When any strike in a basic industry approaches a month in length the people's tendency is to blame the companies. This is based on the American "underdog" principle.

More than ever before the steel industry knew what it was in for if it took a strong stand in the middle of an election period; and when the business boom was still strong. It must have known that a long strike would eventually produce inflationary overtones. But it knew also that an easy and costly settlement would have triggered far greater inflationary effects. It was a question of arithmetic and facing reality.

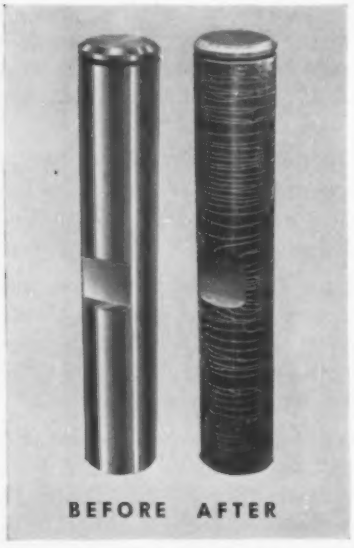
In its dilemma the industry took the hard way out.

Tom Campbell

EDITOR-IN-CHIEF

Case Studies: TESTING METHODS

Stresscoat is a Magnaflux developed brittle lacquer coating for testing and measuring stresses in working parts and designs. Stress analysis is providing new ways to reduce the cost and weight of products to make them stronger, better and cheaper.



Inspection with fluorescent Magnaglo under black light reveals cracks as glowing danger signals impossible to overlook. Magnaglo increases the speed of inspection and makes it easy to spot and identify defects in keyways, threads and other hard to see places.

Write for complete details concerning any of the above case studies, (excerpts from MAGNAFACTS), or ask for our new booklet on Lower Manufacturing Costs.

"GOOD TURN" INSURANCE pays off for the Todd Shipyards Corp., Brooklyn, N. Y. A portable Magnaflux unit is used to inspect for cracks in keyed taper of an 18" propellor shaft of one of the giant ocean-going vessels.

Extra Savings in Both Manufacturing and Preventive Maintenance Inspection

Ⓜ methods pay "extra" dividends when used to inspect the products you make. These testing methods help pinpoint early defects in forgings, weldments, castings, bar steel and other component parts in the "rough" or finished state. It enables you to take corrective steps to eliminate their cause in the production process. You save the time, money and materials usually lost by processing defective parts and excessive scrap. By clearly showing the extent and seriousness of defects, Ⓜ methods provide added benefits from salvage operations.

A "safety" bonus can mean more than dollar savings in a preventive maintenance inspection program. Early detection of fatigue cracks in a crane hook can prevent an accident which could cost lives as well as money. Magnaflux offers many complete, easy, quick, portable methods for "in plant" or "in the field" inspection of machinery and equipment.

Consider for a moment, the many ways Ⓜ test methods can help you save "extra" in your present operations. Consult your Magnaflux engineer for specific information and examples of how Ⓜ can help you produce better for less!

"Conveyorized" Magnaflux inspection is engineered for jet engine production line. Jet engine vanes are inspected at the rate of 5,000 or more a day. First step is magnetizing vanes. Conveyor moves vanes into inspection booth (above) where inspector watches for any accumulation of magnetic particles indicating longitudinal defects. After passing through a second ferro-magnetic bath and longitudinal magnetic field, vanes are inspected for transverse defects. Then they move automatically through a de-magnetizer.

Take Your Inspection Problems to the House of Answers . . .

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dear editor: *letters from readers*

Forgotten Man

Sir:

I would appreciate it very much if you would send to me at your convenience ten reprints of the article entitled "Labor: Small Business is Forgotten Man" in your July 5 issue. We have found this to be a very interesting article. *W. D. Reed, President, Star Tubular Products Co., Chicago, Ill.*

Circular Slide Rule

Sir:

We recently received a reprint from your March 29, 1956, issue entitled "How Warehouse Buying Pays"—the article was written by K. W. Bennett.

At one point in the article you mention the circular slide rule, Mark Purchasing Lot Size Calculator. We would appreciate your giving us any additional information you have concerning this calculator, and if at all possible, we would like to know the supplier.

Your early reply will be most helpful. *F. V. Halstead, Purchasing Agent, Gardner Machine Co., Beloit, Wis.*

Write Mr. Van D. Mark, P. O. Box 67, Mt. Clemens, Mich.—Ed.

Get Out and Sell

Sir:

Please mail to my personal attention ten copies of the article "Economy—Don't Give Up The Ship."

I think you are to be commended on the tone of this article. In times such as we are undergoing now too many people have a tendency to throw up their hands rather than to roll up their sleeves and get out and sell. *J. F. Helsel, Vice Pres. & Gen. Mgr., Ferro Powdered Metals, Salem, Ind.*

We still have a few reprints of this June 7 article.—Ed.

Metal Finishing

Sir:

Your special section on "Plating and Metal Cleaning" in the June 28th issue has two or three tables on Government specifications credited to N. E. Woldman and R. H. Schoemann. These are not identified.

That section contains some very helpful information and we have arranged to get reprints for all of our salesmen so you can see we appreciate the job. *D. C. Miner, Advertising Manager, E. F. Houghton & Co., Philadelphia 33, Pa.*

N. E. Woldman and R. H. Schoemann are consulting engineers with offices at 356 North Mountain Avenue, Upper Montclair, N. J.—Ed.

Shotblasting axle housing.

Sir:

In the June 28 issue of your very excellent magazine, you offer additional copies of "How to Get More for Your Plating Dollar" together with Metal Cleaning and Finishing Handbook. May we have one copy and two, if available.

The article is very informative and thought provoking. It is articles of this nature that make IRON AGE. *W. D. Sweetland, Manager, The Brewer-Titchener Corp., Crandal-Stone Div., Cortland, N. Y.*

Copies are still available.—Ed.

Want PRECISION SHEARING at High Speed?

Check These Features and You'll Want a

DI-ACRO* POWERSHEAR

METALS

RUBBER

MICA

FIBRE

PLASTIC

LEATHER

SCREEN MESH

PRECISION—strips less than .025" wide accurately sheared, thousands of parts exactly duplicated.

CUTTING SPEED—ranges from 30 to 200 S.P.M. on Vari-O-Speed models—continuous or single stroke operation.

RATED CAPACITY—16 gauge steel.

EASY TO OPERATE—a woman can operate it.

CHOICE OF MACHINE—two Vari-O-Speed models. Also two Standard Models running at set speeds.

MINIMUM OPERATOR FATIGUE—especially designed for use where a high rate of production must be maintained.

ENGINEERING SERVICE—always at your disposal.

RUGGEDLY BUILT—backed by one year warranty.

DELIVERY—immediate on most models.

COST—that's good too.

*pronounced Die-ack-ro.

WANT MORE INFORMATION?

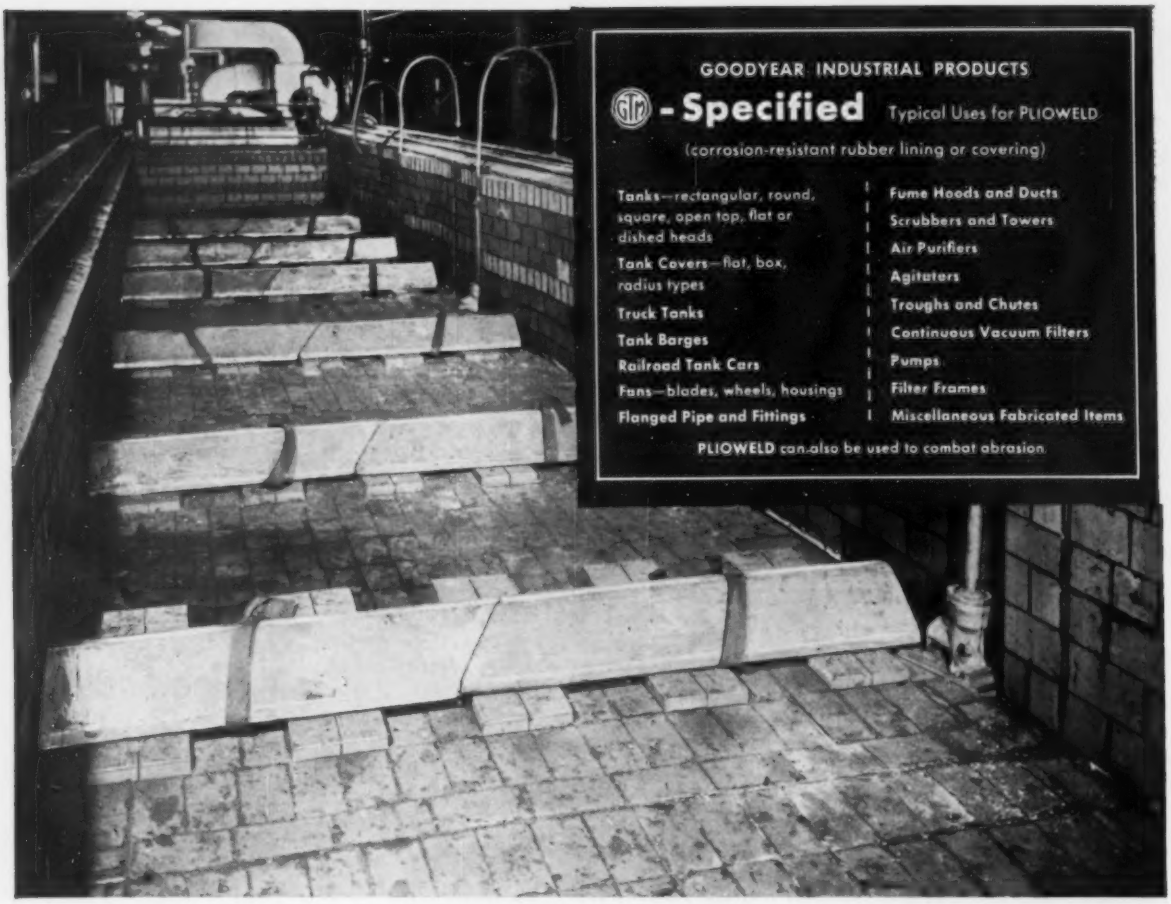
New Catalog gives complete details on all hand and power operated Di-Acro machines.

Consult the yellow pages of your phone book for the name of your nearest Di-Acro distributor or write us.

Creators of "Die-Less Duplicating"

O'NEIL-IRWIN MFG. CO.
302 Eighth Avenue
LAKE CITY, MINNESOTA

di-acro PRECISION METALWORKING MACHINES



G.T.M. reduces pickling tank maintenance by 66%

ALMOST weekly repair of a lead-lined, wooden pickling tank was a major problem for this Midwestern steel processor. Maintenance cost alone ran into the thousands of dollars every year. Moreover, the lead often stuck to the steel strip, causing additional problems.

Finally it was decided to install a steel tank. The G.T.M.—Goodyear Technical Man—recommended a PLIOWELD rubber lining plus two courses of acid-resistant brick. He also helped to develop a series of unique thermal expansion joints between the 40-foot tank sections. Result: *No shutdowns in two years*, except for normal cleaning—maintenance slashed to *one-third its former cost.*

Similar savings may be yours on any industrial rubber application by consulting the G.T.M. Contact him through your Goodyear Distributor, or write Goodyear, Industrial Products Division, Akron 16, Ohio.

PLIOWELD TANK LININGS by

GOODYEAR

THE GREATEST NAME IN RUBBER

Pliowold—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

fatigue cracks

by William M. Coffey

Engineering Pay

If you read "Are You Overpaying Engineers?" in the Jan. 12 IRON AGE you know that our editors did not imply that engineers were by any means overpaid. The point there was that too many companies are wasting engineering brainpower by putting them on tasks which could be done by technicians. Or even clerks, our researchers found.

So we are not surprised to see the No. 1 recommendation of a recent EJC report stress this very point.* Engineers Joint Council, agreeing that there is no simple solution to the problem makes seven recommendations at the conclusion of this little booklet. The first of them is that "management utilize the services of engineers more effectively and thereby afford them the opportunity for advancement and economic improvement."

Since more than 40 pct of management men are engineers—and therefore well over half of all readers of your f.f.j. are of the slide rule—this seems a good place to tell you that the book may be had from EJC on request (see below).

DST

Whether or not you favor Daylight Saving Time it's nice to know who's on it and who isn't. This is a problem our news department faces every summer because we're linked with district editorial offices in Chicago, Cleveland, Detroit, New York, Pittsburgh and Washington by teletype for fast answers to news roundup questions and fast filing of copy.

This summer we've solved it with a 3-color map which the construction firm of F. H. McGraw sent along. Without violating their copyright we can tell you that everything directly north and east of Maryland is on DST. So are Ill., Ind., Calif. and Nev. and 22 cities in states that otherwise are on ST. Included in the latter cities are Richland, Wash., and Los Alamos, N. M. Something nuclear, no doubt.

Space Man

We've had a number of inquiries about a little cartoon we ran recently (see cut). Before this thing gets any further we hasten to furnish this explanation direct from the cartoon-picking committee:

"No criticism of THE IRON AGE space salesmen or any other magazine space salesmen was implied. Any resemblance to any living space salesman is on a take-it-or-leave-it basis."

"I think he's a space salesman!"

* "Raising Professional Standards and Improving Employment Conditions for Engineers," Engineers Joint Council, 29 West 39th St., New York 18, N. Y.

If your sawing costs are mounting because you're not getting consistent low-cost operation, maximum production, and minimum downtime, call your Victor Distributor. He's the man who can bring your costs down to eye level. Once he's listened to your troubles, he'll recommend the *right* Victor Hand and Power Hacksaws, Metal and Wood Cutting Band Saws, and Hacksaw Frames for all your needs.

Your Victor Distributor will especially want to tell you about Victor "Moly"® High Speed steel blades. He'll tell you that "Moly" blades can save you real money because they outlast standard steel blades 10 to 1, cut as well as the *best* high speed steel blades made, and yet are substantially lower in cost!

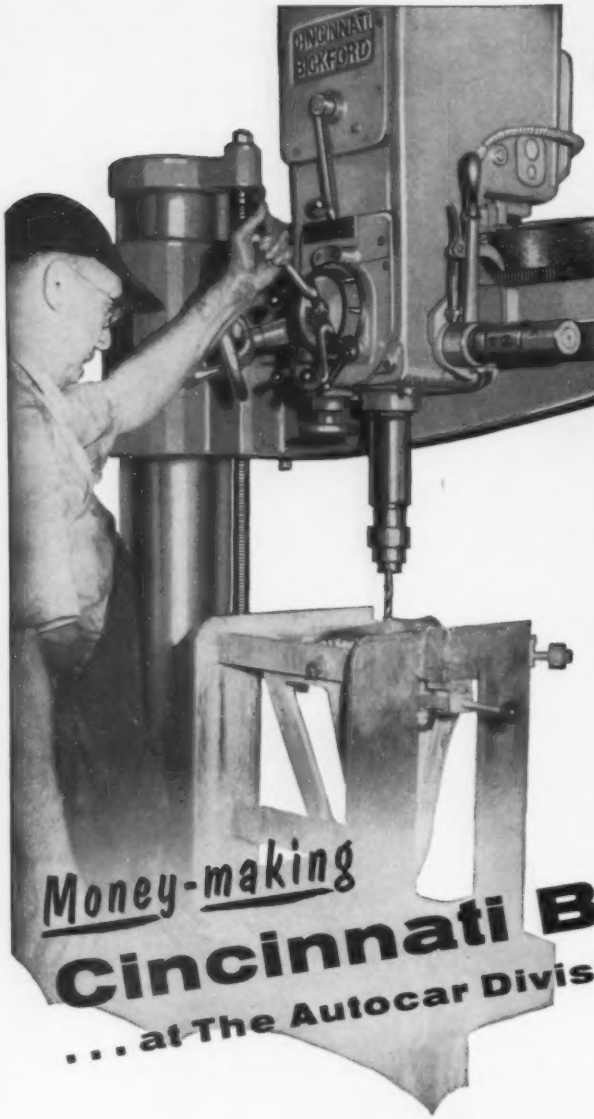
And be sure to ask your Victor Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts. They're packed full of interesting information.

Sold Only Through Recognized Distributors

1890

VICTOR

SAW WORKS, INC., MIDDLETOWN, N.Y., U.S.A.
MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES



The 9" dia. column 3' arm Cincinnati Super Service Radial is working on chassis frame parts and aluminum steering column brackets; ¼" dia. to 1¼" holes drilled and reamed to a .0015" tolerance.

The Upright Drill shown is one of six 28" Super Service Uprights working on heat treated alloy steel frames.

Money-making Cincinnati Bickford machines ... at The Autocar Division, WHITE MOTOR CO. —EXTON, PA.

Photos courtesy the Autocar Division of The White Motor Company, Exton, Pennsylvania.

Speed and easy handling—power and accurate, steady performance were factors in the selection of Cincinnati Bickford Super Service Radial and Upright Drills in this plant. They are quickly adaptable to a variety of operations, including drilling, reaming, tapping and trepanning.

For rapid, accurate, dependable production investigate these cost reducing modern drilling machines.

Write for Bulletin R21C.

CINCINNATI BICKFORD

SUPER C B SERVICE

RADIAL AND UPRIGHT DRILLING MACHINES

CINCINNATI BICKFORD DIVISION

GIDDINGS & LEWIS MACHINE TOOL COMPANY

OAKLEY, CINCINNATI 9, OHIO, U.S.A.

dates to remember

JULY

National Tools & Die manufacturers Assn.—Summer meeting, July 25-28, Estes Park, Colo. Society headquarters, 907 Public Square Bldg., Cleveland.

Cutting Tool Manufacturers Assn.—Quarterly meeting, July 25, Lochmoor Country Club, Detroit. Society headquarters, 416 Penobscot Bldg., Detroit.

EXPOSITIONS

Assn. of Iron & Steel Engineers, Sept. 25-28, Cleveland.

Metal Show—Oct. 8-12, Cleveland.

AUGUST

Society of Automotive Engineers, Inc.—National west coast meeting, Aug. 6-8, Mark Hopkins Hotel, San Francisco. Society headquarters, 29 W. 39th St., New York.

National Screw Machine Products Assn.—Annual national sales conference, Aug. 7-8, Wade Park Manor Hotel, Cleveland. Society headquarters, NSMPA Bldg., Cleveland.

Western Electronic Show and Convention—Aug. 21-24, Pan Pacific Auditorium and Ambassador Hotel, Information, WESCON, 344 N. LaBrea Ave., Los Angeles.

SEPTEMBER

Metal Powder Assn.—Fall meeting, Sept. 7-9, Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., N. Y.

American Institute of Chemical Engineers—Fall meeting, Sept. 9-12, William Penn Hotel, Pittsburgh. Society headquarters, 120 E. 41st, N. Y.

Society of Automotive Engineers—National tractor meeting and production forum, Sept. 10-13, Hotel Schroeder, Milwaukee. Society headquarters, 29 W. 39th St., N. Y.

American Die Casting Institute—Annual meeting, Sept. 11-13, Edgewater Beach Hotel, Chicago. Society headquarters, 366 Madison Ave., N. Y.

FIRE!

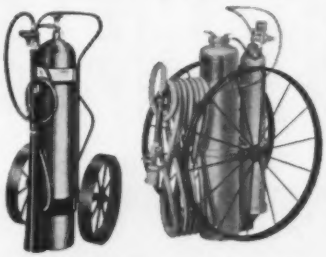
HOW TO DETECT AND EXTINGUISH IT IN SECONDS!

HAND PORTABLES

Carbon Dioxide — Foam Soda-Acid Clear Water Anti-Freeze — Pressurized Water Anti-Freeze — Dry Chemical

Kidde CO_2 Portables, either trigger-release type or squeeze-type valve models, are available in sizes from 2½ to 20-pound capacities. New Kidde Wet Chemical extinguishers are available in 2½ gallon bronze or stainless steel models, including pressurized Water or Water-Anti-Freeze Unit (illustrated). Kidde Dry Chemical Extinguishers are available in cartridge-operated models of 20 and 30 pounds capacity or pressurized models of 5 and 10 pounds capacity.

MOBILE EQUIPMENT

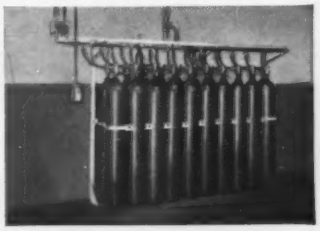


50, 75 and 100 lb. CO_2 Units — 150 lb. Dry Chemical Unit

For major fire hazards, get a mobile unit. Wheeled CO_2 units are available in 50, 75 and 100 pound capacities, in one cylinder.

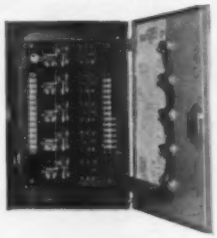
150 pound dry-chemical unit has straight stream for long range . . . fan pattern for wide coverage. Both units give expert results even with inexperienced operator.

CO_2 SYSTEMS



New Kidde pressure-operated CO_2 extinguishing systems are individually designed to fully protect even the most dangerous hazards, use no falling weights or clumsy mechanical triggering methods. Pneumatic Control Heads insure instant and complete CO_2 discharge. Directional Valves afford protection to more than one hazard using the same bank of CO_2 cylinders.

ATMO DETECTING SYSTEMS



Kidde ATMO is a wide-area automatic fire detecting and warning system which works on the principle of rate-of-temperature-rise. It is ideally suited for cases where life protection is of vital importance, or where quick, early detection of fire in valuable materials is essential.

The very first hot breath of fire triggers the ATMO system, and sounds the alarm. In addition, the system can also close doors, shut off fans or blowers – all *automatically*.

What's more, the Kidde ATMO system operates independently of regular power sources, will still give protection even if outside power fails.

Kidde

Walter Kidde & Company, Inc.
749 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada, Ltd.
Montreal—Toronto

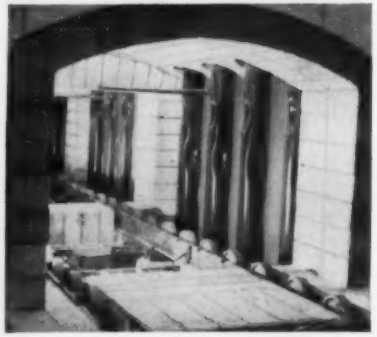
this Lindberg Vertical Radiant Tube increases

A better way to apply heat to metal

When metal needs heat, Lindberg furnaces with the new Lindberg lightweight vertical radiant tube offer a better way to apply it. Industry the world over is finding that Lindberg furnaces with this new vertical tube provide advantages no other type of furnace can give.

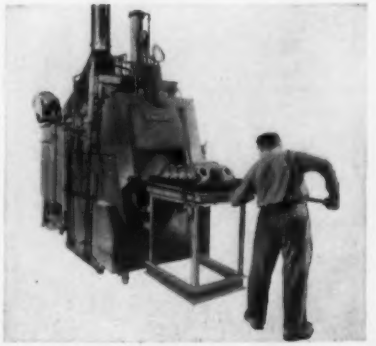
Whatever type or size of furnace fits your production needs, from gigantic continuous pusher-type to the small batch-type furnace, Lindberg engineers can develop exactly the right equipment for you, embodying all the advantages of this revolutionary new vertical radiant tube.

The Lindberg vertical tube gives you these advantages



Improved Performance
Because of Lindberg's revolutionary design, this tube (patent applied for) provides a new level of furnace performance. The secret lies in the new

Typical Lindberg Vertical Tube Furnaces



Lindberg gas-fired vertical radiant tube carburizing and carbonitriding furnace. The Lindberg vertical tube is ideal for these heat treating processes which require rapid uniform heating.

We'd like to show our vertical tube vertically. Do you mind turning the magazine?

furnace efficiency and lowers costs

This scale reproduction is exactly one-fourth actual size.

Lindberg tube's "dimples." Here's how they work—in the radiant tube a central stream of mixed air-and-gas is surrounded by a cylindrical stream of air alone and combustion occurs in the area between these two streams. The "dimples" create eddies in the streams accelerating combustion and maintaining even temperatures along the entire tube.

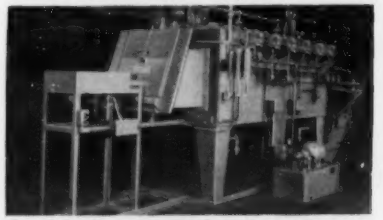
Maximum Dependability

This Lindberg tube will operate at maximum efficiency for a longer period of time. The special green silicone enamel, a Lindberg exclusive, gives greatest possible resistance to carbon penetration and greatly prolongs tube's operational life. Vertical position eliminates soot deposit inherent in horizontal tubes with resultant temperature increases at points of sooting. Lindberg tubes work effectively longer.

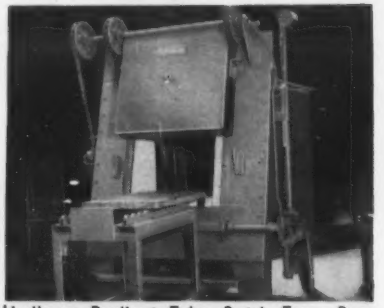
New Economy in Operation

With Lindberg vertical radiant tubes the bulk and bend problems of old-fashioned horizontal tubes are eliminated. Tubes are just 59 inches long and weigh only 29 pounds. No costly furnace shut-downs and no high labor and material cost for tube change. Turn off the furnace, lift out the old tube, put in the new one. Literally, a matter of minutes. Savings in space and fuel costs, too.

Lindberg vertical radiant tube pit carburizing furnace. Note small amount of space required for tubes.



Small Lindberg vertical radiant tube gas-fired hydraulic pusher type carburizing furnace. In this installation heating chamber is only 10 inches high.



Lindberg Radiant Tube Batch Type Box Furnace. Even small furnaces can be heated efficiently with radiant tubes.

Lindberg Field Representatives in 21 cities are ready to work with you for the improvement of your heat treating processes. Consult classified section of phone book or write us direct.

LINDBERG ENGINEERING COMPANY

2452 West Hubbard Street, Chicago 12, Illinois
Los Angeles Plant: 11937 South Regentview Avenue, at Downey, California

FELLOWS EQUIPMENT FOR FINE-PITCH GEARS

cuts production time up to 50% at *ALLING-LANDER!*

1. Gears for a major instrument maker: Fellows 3" Fine-Pitch Gear Shaper turns them out at one-third previous cost, more than twice as fast: 120 finished gears per hour, compared to old rate of 55.

2. For extra precision: Fellows No. 4 Fine-Pitch Gear Shaving Machine makes good gears better with finer finish, minimum backlash, tighter tolerances where desired.

3. Proof: Fellows No. 4 Fine-Pitch Red Liner Inspection Instrument makes a permanent, graphic record of gear quality . . . quick, efficient and accurate.

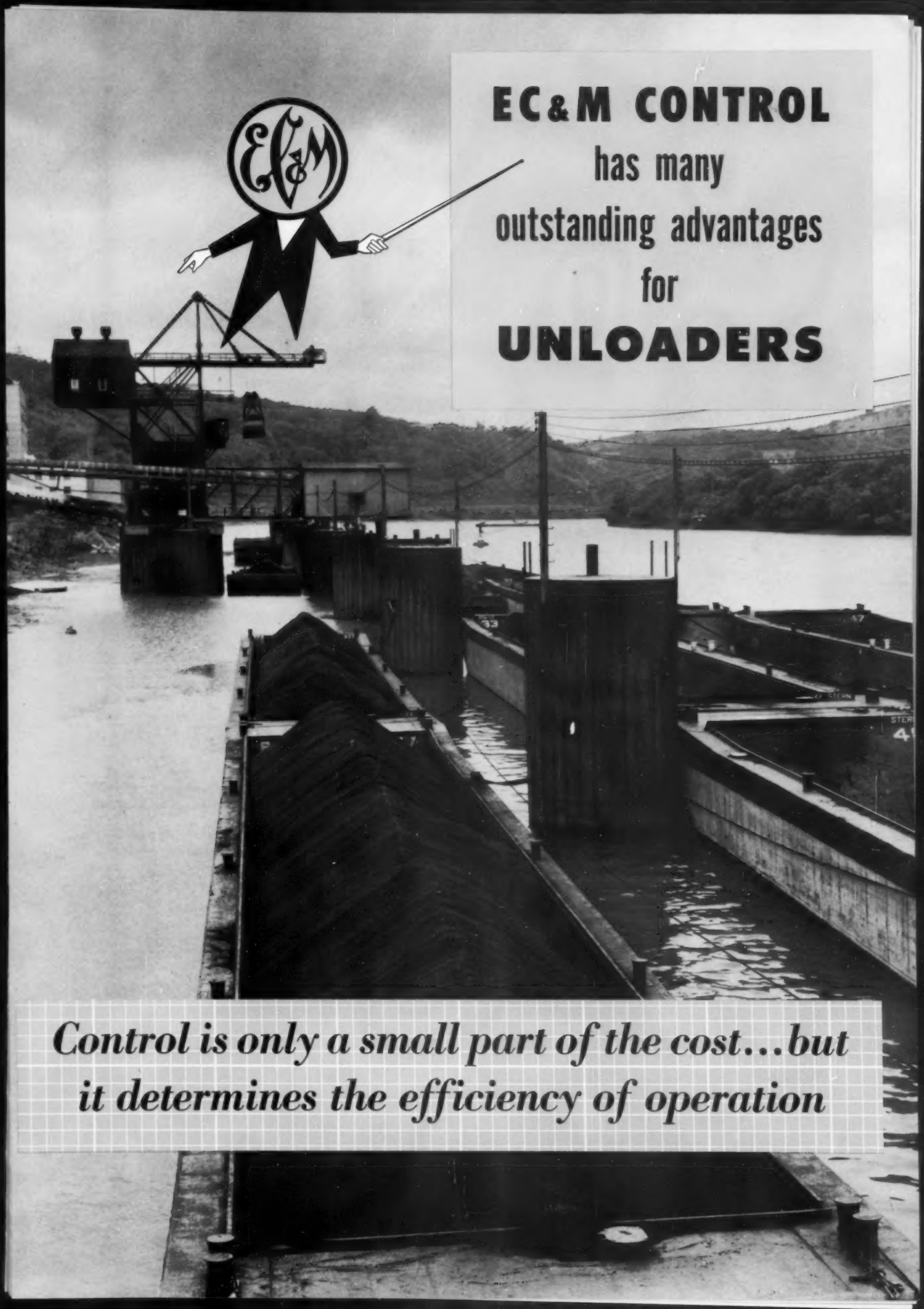
Well known for their excellent service in producing instrument type gears of close tolerance, the Alling-Lander Company, Inc. of Sodus, New York has cut gear production time up to 50%, and unit costs more than half, by using the latest Fellows equipment in their fine-pitch gear department.

Fellows Precision Line also includes other types of gear inspection instruments and a number of models of Gear Shapers for cutting spur and helical gears of larger sizes. Your Fellows representative can give you information about any of them. Write, wire or phone any of our offices.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices: 319 Fisher Building, Detroit 2
5835 West North Avenue, Chicago 39
150 W. Pleasant Ave., Maywood, N. J.
6214 West Manchester Avenue, Los Angeles 45

THE PRECISION LINE

Fellows *Gear Production Equipment*


EC&M CONTROL
has many
outstanding advantages
for
UNLOADERS
Control is only a small part of the cost...but
it determines the efficiency of operation

EC&M CONTROLLERS . . .

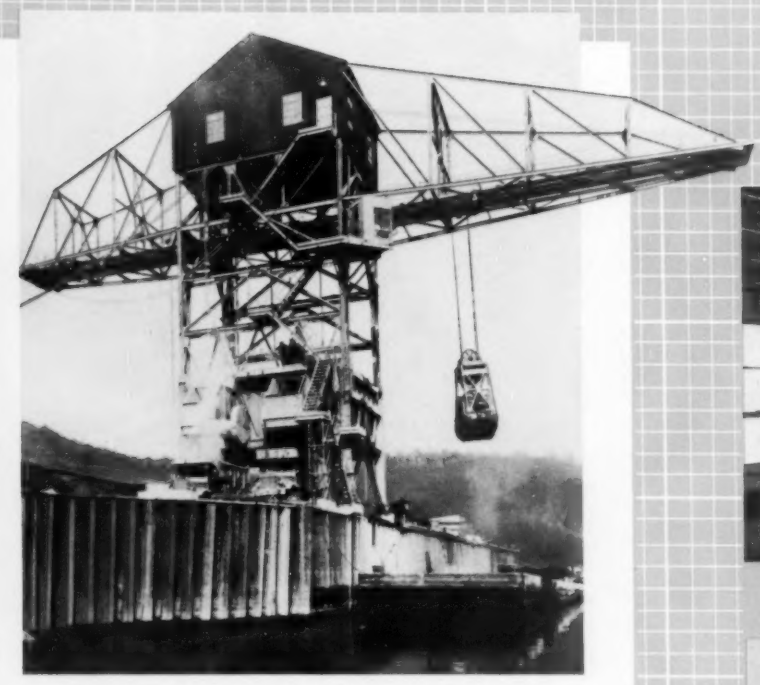
Coal is handled from barge to power plant at an eastern electric generating plant at the rate of 400 tons per hour by this Clyde Unloader equipped with EC&M Control. **Photos — courtesy of Clyde Iron Works, Inc.**

Barges of coal (900 tons per barge) as shown on the preceding page, are unloaded by this 7-Ton Wellman Unloading Tower under EC&M Control at a western Pennsylvania generating plant. **Photos — courtesy of West Penn Power Co.**

On the Ohio River, this McKiernan-Terry Unloading Tower equipped with EC&M Control lifts coal from river barges at the rate of 1200-Tons per hour to supply this generating plant.

Two 15-Ton Dravo Unloaders at the B & O Import Ore Pier at Baltimore, Maryland are completely equipped with EC&M Control. This pier established an eastern seaport record for unloading ocean vessels.

operating from standard voltages . . . are low in cost, safe, simple and easy to operate



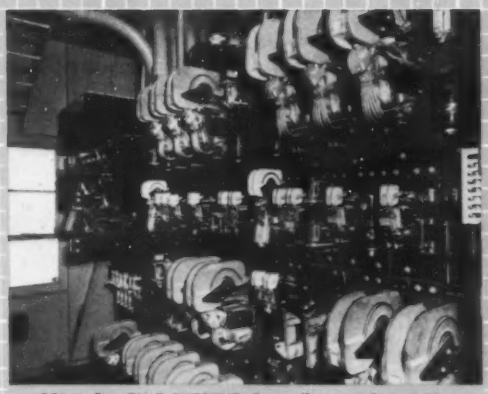
500-ton-per-hour Barge Unloader, designed, fabricated and erected by Heyl & Patterson for the Duquesne Slag Company, Pittsburgh, Pa., and equipped with EC&M Control has been giving excellent results for many years.

Ton by ton . . . EC&M Control helps move bulk materials with an increased output and lower cost that appeal to management. Operators appreciate the smoothness of performance and quick manipulation.

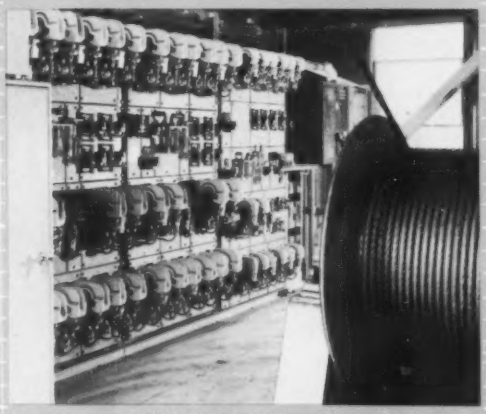
Time-saving advantages of this Control are numerous. Some of these are: facility for paying out cable to dig into the pile, taking the swing out of a loaded bucket at the point of discharge, and keeping the bucket open when lowering for another load.

On river unloading stations, at lake and ocean ports, EC&M Control has earned a reputation for fast lifts . . . safe lifts. To EC&M, each material handling machine is thoroughly investigated . . . the mechanical as well as electrical details, the duty cycle and all important data are considered. From *these facts*, EC&M *accurately engineers* the control for the individual job . . . this results in the greatest service at lowest maintenance. EC&M Control is well-known for reduced manpower and lower renewal part expense. Look at the proof of acceptance of EC&M Control for the wide range of applications shown here.

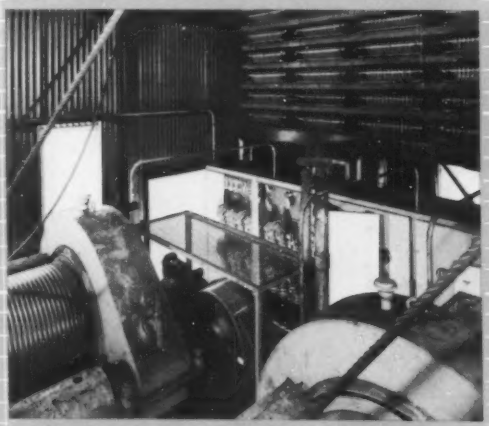
It pays to "SPECIFY EC&M CONTROL"



EC&M D-c TIME-CURRENT Controllers on Dravo Unloaders. All power is brought into the operator's cab on this installation for maximum safety.



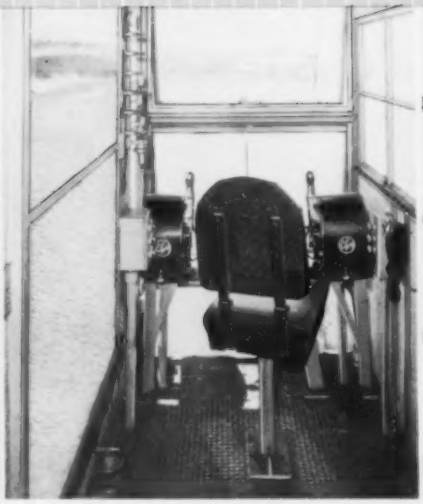
EC&M A-c FREQUENCY-RELAY Controllers provide accurate switching of Closing and Holding Line circuits to give maximum safe torque output of the a-c motor.



This view shows EC&M Type WB Brake, Frequency Relay Controllers in Cabinets with TAB-WELD Plate Resistors mounted overhead.

Quick Response coordinated with *Safe Operation*

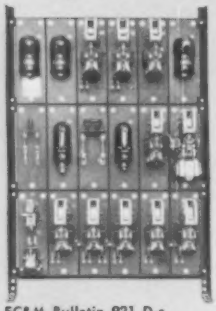
Narrow width EC&M Cam Master Switches are closely grouped for operator's convenience in this cab.



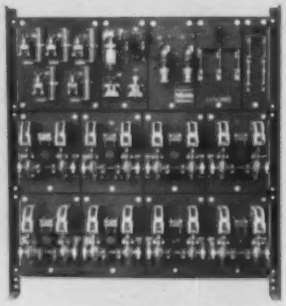
In this narrow cab, EC&M Cam Master Switches require minimum space. This short throw of operating handles contributes to the ease of operation.

Here, the operator controls the Trolley movement through a Foot Master Switch. Hand-operated EC&M Cam Master Switches are used to control the bucket operation.

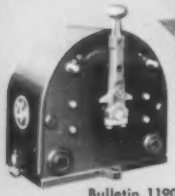
Control Engineered for the Job gives smoother performance



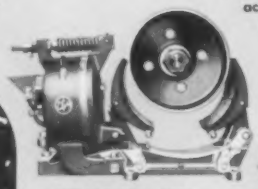
EC&M Bulletin 921 D-c Crane-hoist Controller uses the Wright Circuit for safety, simplicity.



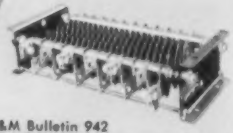
EC&M Bulletin 930 A-c Contra-torque Hoist Controller with Frequency Relays for acceleration, plugging and speed limiting functions.



Bulletin 1190 EC&M Cam Master Switches are narrow in width and have a short throw from full-on to full-off positions.



EC&M Bulletin 1000 WB Brakes give fast release . . . quick set. Are supplied for rectifier-operation on A-c motors.



EC&M Bulletin 942 TAB-WELD Resistors save manpower. No periodic clamping-nut tightening . . . no burning at grid eyes or at tap-plates.

Here's where EC&M Control excels

FAST GETAWAY EC&M uses load-responsive acceleration relays (Time Current on d-c, Frequency Relay on a-c) to provide maximum, safe torque values for efficient unloader operation. These exclusive EC&M Relays provide the fastest, safest acceleration which results in rapid bucket handling . . . fast trolley movement . . . overall reduced time between trips.

WIDE SPEED SELECTION The operator always has at his command a choice of speed-points. And the better speed-range on each point provides greater flexibility for normal operation and during clean-up.

SMOOTHER STOPPING When checking motor lowering speeds, the Resistor values of EC&M Control are *accurately designed* to give quick, safe, smooth stopping of light loads, full loads or the empty bucket. EC&M Acceleration and Plugging Relays automatically govern the rate of acceleration, stopping and reversal of the trolley motion for top performance.

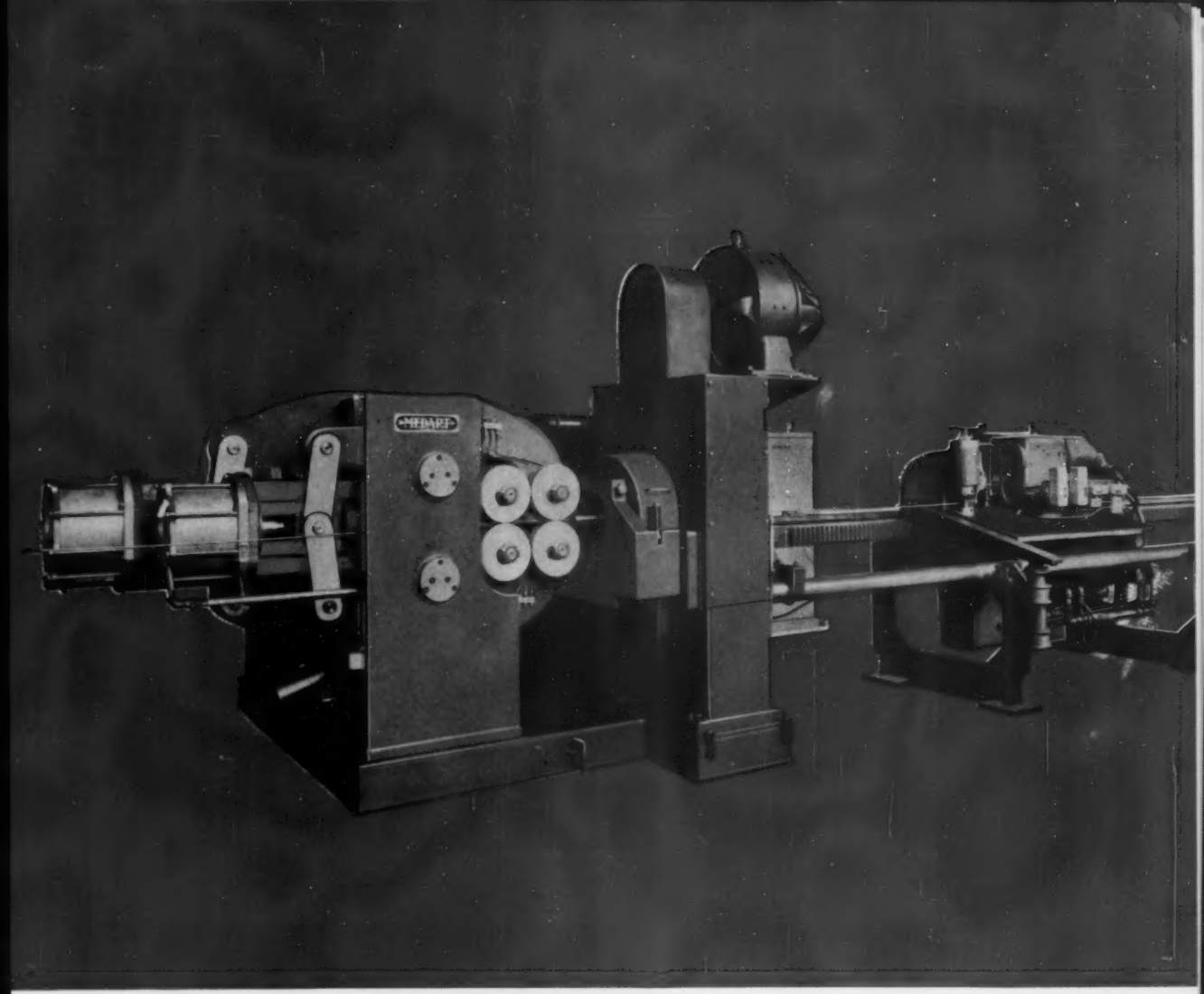
SPEED-LIMITING *Safety* on all Speeds. EC&M High-speed Contactors respond instantly to the Operator's manipulation of the Master Switch; motor connections are switched quickly to conform with the well-known characteristics of EC&M Circuits, which maintain safe lowering and operating conditions at all times.

When buying UNLOADERS, specify EC&M Control

SQUARE D COMPANY

EC & M DIVISION • CLEVELAND 28, OHIO

LITHOGRAPHED IN U.S.A.



BLAW-KNOX MEDART *makes what it takes*

for high speed, carbide, centerless bar turning

The new Blaw-Knox Medart RFPD Centerless Bar Turner is designed especially to take advantage of higher cutting speeds possible with carbide cutting tools. One pass through the machine accomplishes a complete removal of surface defects and decarburization at high production rates. And you get 100% recovery in the form of chips.

A patented "torque chipping" device absorbs the twisting imposed on the workpiece by the cutting tools. This feature opens an entirely new field of turning small diameter bars. The workpiece is centered in the cutterhead regardless of variation in diameter by a pneumatically operated device on the roll feed. The workpiece is kept under positive tension by the pull-out carriage throughout the cutting action.

Blaw-Knox Medart fully automatic Centerless Bar Turners are available in sizes for turning ½" to 9" diameter bars. Call us for complete details, technical assistance or service.

50th Anniversary
BLAW-KNOX
1906-1956

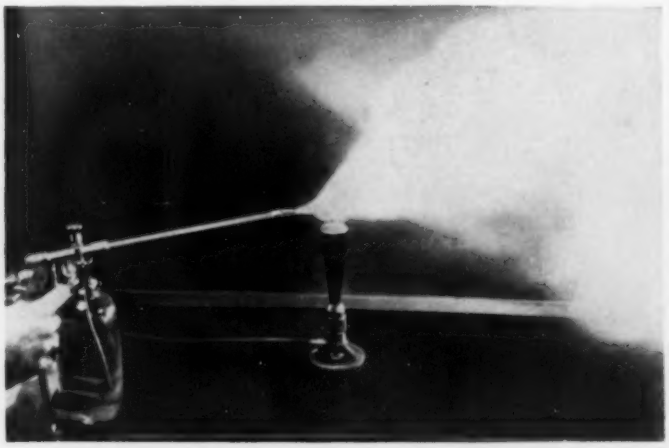
BLAW-KNOX COMPANY
Foundry & Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

CONTINENTAL
Foundry & Machine

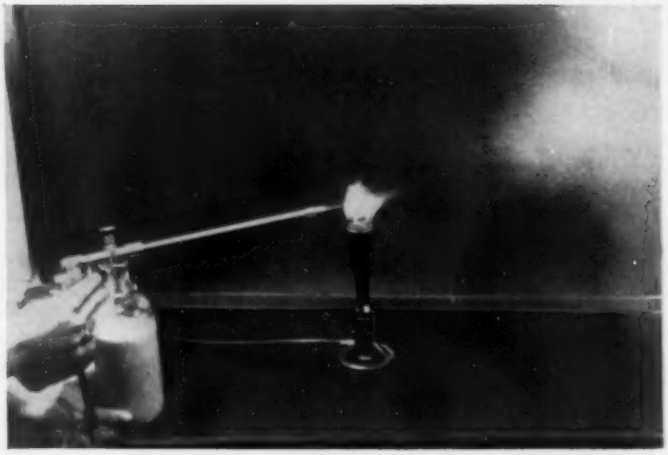
Announcing...the First

HYDRAULIC

Flame tests prove its fire-snuffing ability



This photo shows the instant combustion taking place when a conventional hydraulic oil of mineral oil type is atomized over a Bunsen burner.



In this photo, Shell Irus Fluid 902 replaces the mineral oil. Note that there is no ignition.

SHELL IRUS FLUID 902

Oil-Base fire-resistant FLUID

SHELL IRUS FLUID 902

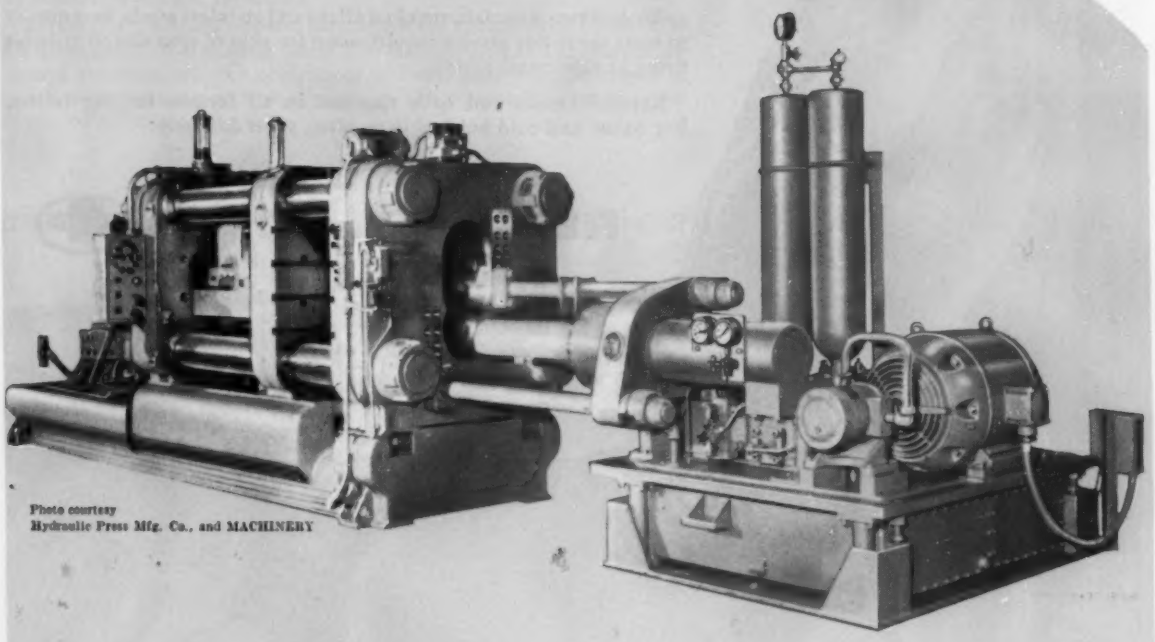


Photo courtesy Hydraulic Press Mfg. Co., and MACHINERY

AFTER THREE YEARS of intensive research, field application and evaluation, Shell Irus Fluid 902 is now commercially available for use in industrial hydraulic systems. While its cost is far lower than other fire-resistant fluids, its performance is comparable.

No major modification of equipment is necessary. Shell Irus Fluid 902 is a special formulation containing no corrosive ingredients . . . no adverse effect on seals or fittings. It is a direct replacement for hydraulic oils now in service.

Noncorrosive, and nonrusting. Steel and copper panels immersed in Irus Fluid 902 for one week at 160°F have shown no significant signs of corrosion. Rusting has not been a problem in long-continued field tests.

This is an efficient fire-snuffing hydraulic fluid that can be widely used. Send coupon for details.

SHELL OIL COMPANY

50 WEST 50 STREET, NEW YORK 20, NEW YORK

100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

SHELL OIL COMPANY
50 West 50th St. or 100 Bush St.
New York 20, N. Y. San Francisco 6, Cal.

Please send me test data and information on Shell Irus Fluid 902.

Name_____

Company_____

Address_____

_____

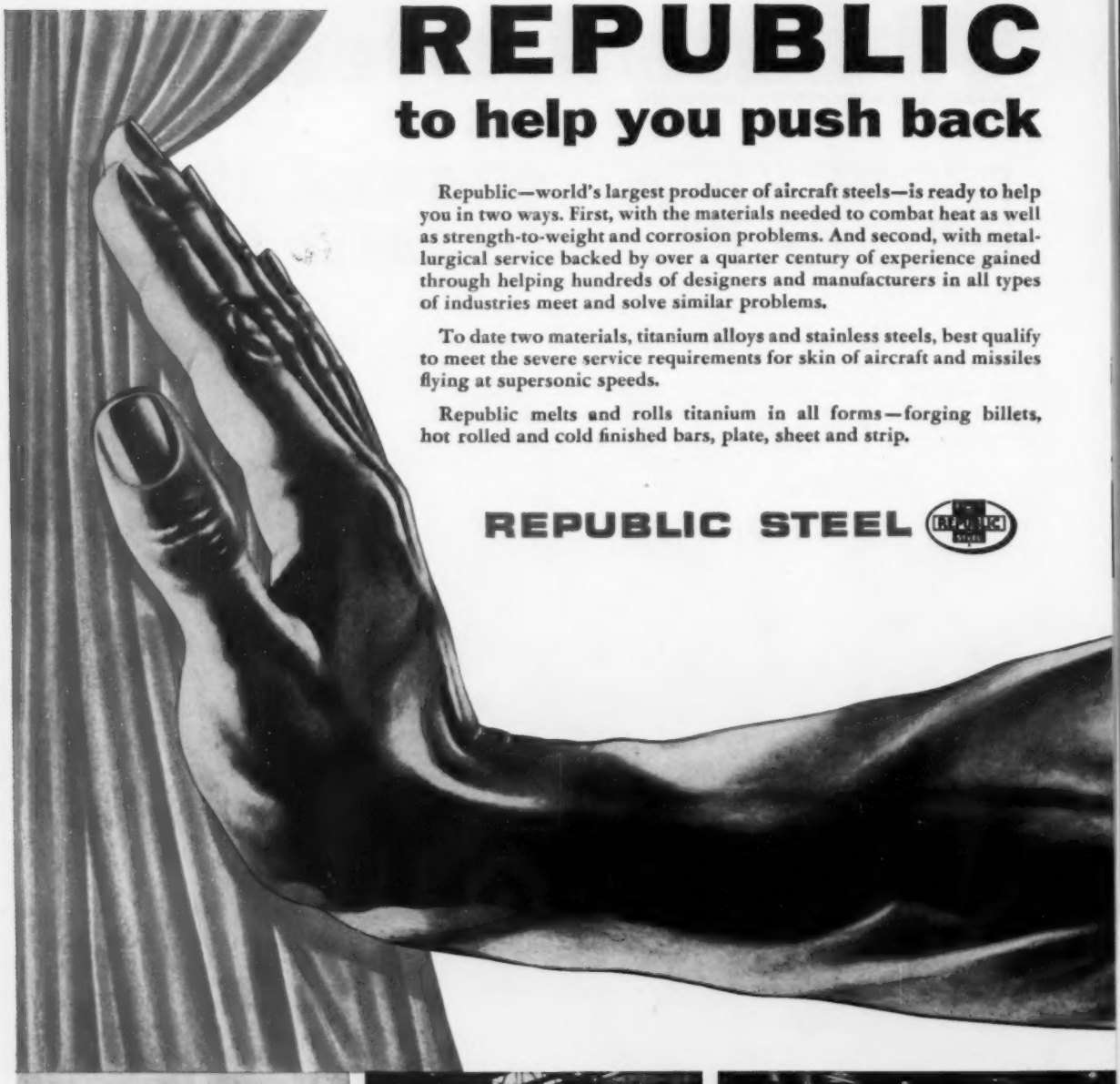
REPUBLIC
to help you push back

Republic—world's largest producer of aircraft steels—is ready to help you in two ways. First, with the materials needed to combat heat as well as strength-to-weight and corrosion problems. And second, with metallurgical service backed by over a quarter century of experience gained through helping hundreds of designers and manufacturers in all types of industries meet and solve similar problems.

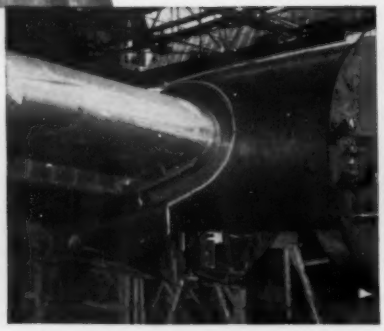
To date two materials, titanium alloys and stainless steels, best qualify to meet the severe service requirements for skin of aircraft and missiles flying at supersonic speeds.

Republic melts and rolls titanium in all forms—forging billets, hot rolled and cold finished bars, plate, sheet and strip.

REPUBLIC STEEL



NEW DEVELOPMENTS create new uses. A unique tank truck with one compartment made of ENDURO Stainless Steel safely handles a corrosive alcohol-water mixture used in turboprop engines. Another compartment, for kerosene, is fabricated from Republic High Strength Steel for extra strength without added weight.



WEIGHT—On the DC-7 superliner, a weight saving, equivalent to one passenger and his luggage, resulted when Titanium replaced other materials normally used in nacelle construction. And with no sacrifice in strength or safety. Titanium offers the highest strength-to-weight ratio of construction metals.

SOLVING HEAT PROBLEMS is old stuff for ENDURO Stainless Steel. ENDURO's ability to withstand heat without loss of strength has been proved on jet engines where it is used for structural and burner components, rings, exhaust systems, afterburners. Now it is being used for skin material to resist high temperatures at supersonic speeds.

STEEL IS READY

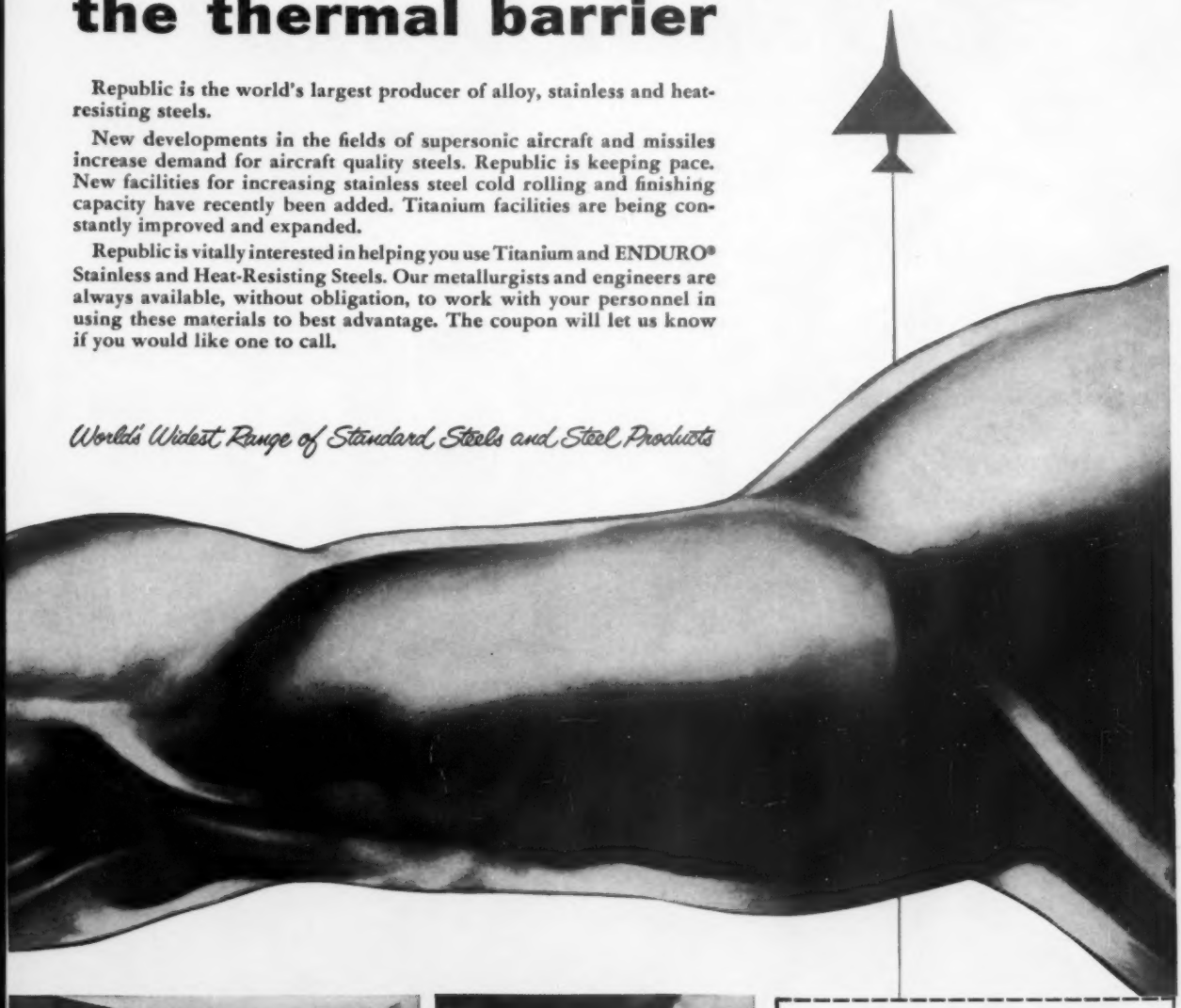
the thermal barrier

Republic is the world's largest producer of alloy, stainless and heat-resisting steels.

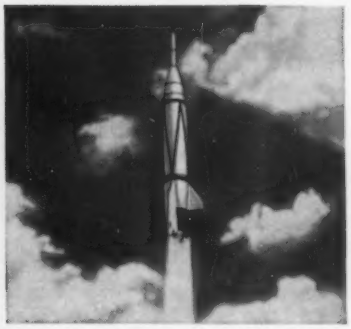
New developments in the fields of supersonic aircraft and missiles increase demand for aircraft quality steels. Republic is keeping pace. New facilities for increasing stainless steel cold rolling and finishing capacity have recently been added. Titanium facilities are being constantly improved and expanded.

Republic is vitally interested in helping you use Titanium and ENDURO® Stainless and Heat-Resisting Steels. Our metallurgists and engineers are always available, without obligation, to work with your personnel in using these materials to best advantage. The coupon will let us know if you would like one to call.

World's Widest Range of Standard Steels and Steel Products



STRENGTH—Landing gear fabricated from Republic Alloy Steels can take the tremendous strain when aircraft hit the runway at high speeds. These fine steels provide the high strength and toughness needed to withstand high impact and heavy loads—provide the hardenability to resist wear at bearing surfaces.



CORROSION-RESISTANCE—Titanium's extremely high corrosion-resistant properties make it attractive for many applications, such as tanks for acids used in combination with missile fuels. Nitric acid has negligible effect on Titanium. It is practically immune to salt water and sea air corrosion.

REPUBLIC STEEL CORPORATION
Dept. C-2244
3104 East 45th Street
Cleveland 27, Ohio

Send more information on these Republic products.

- ☐ ENDURO Stainless Steel
- ☐ High Strength Steel
- ☐ Alloy Steel
- ☐ Titanium
- ☐ Have a metallurgist call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

Can I afford a Towmotor?

You can!

Typical savings produced by Towmotor Fork Lift Trucks are revealed in recent Certified Job Studies which show that: For one company, one Towmotor Fork Lift Truck paid for itself in 10 months. For another company, six Towmotor units saved $50,000 in a single year.

It's an amazing fact that most companies now using outdated materials handling methods are, through hidden costs, already paying the price of Towmotor equipment. To discover how you can save money on your materials handling, call your Towmotor representative today! . . . or write for Certified Job Studies covering your industry. TOWMOTOR CORPORATION, Div. 1507, 1226 E. 152nd St., Cleveland 10, Ohio.

Read how a Manufacturer of metal castings cut over-all handling costs 60%. Ask for Job Study #108

America's ***best engineered*** *fork lift truck*

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THERE'S ONLY ONE FORK LIFT TRUCK CALLED TOWMOTOR

B-RIGHT-ON®

SOCKET SCREW PRODUCTS

always measure up!

QUALITY B-RIGHT-ON® PRODUCTS

Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

Write for descriptive literature . . . see how

YOU CAN DO BETTER WITH B-RIGHT-ON.

THE BRIGHTON SCREW & MANUFACTURING CO.

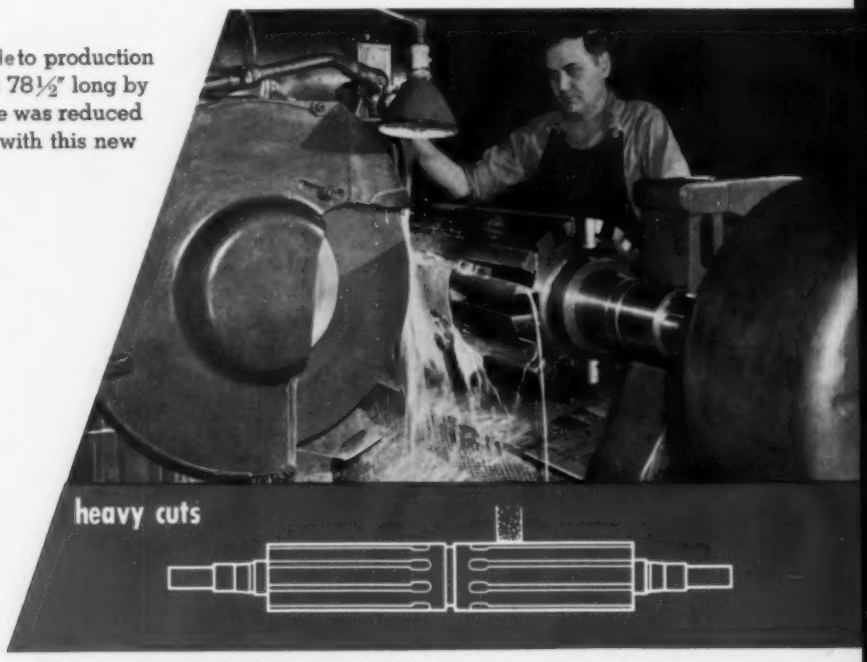
1829 READING ROAD, CINCINNATI 2, OHIO

You Can Get Results Like These

from modern Landis

heavy cuts

Interrupted cut no obstacle to production of these slotted cylinders 78½" long by 13⅝" O.D. Grinding time was reduced from 7 hours to 6 hours with this new Landis grinder.



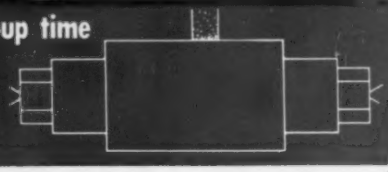
LANDIS 24" x 120" type FR Roll Grinder
Detailed specifications in Catalog F-48.
Send for your copy today.

LANDIS

precision grinders

type FR Roll Grinders . . .

savings in set-up time

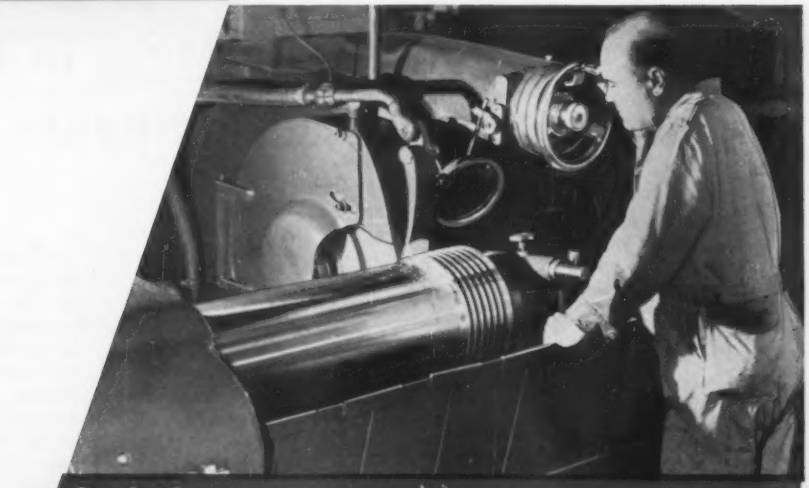


savings in set-up time

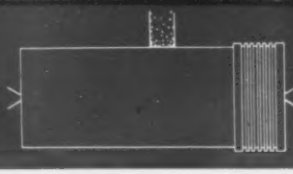
Regrinding roll for cold rolling operations. Patented crowning mechanism insures exact duplication of crowning setting on every job. Rolls have 20″ face and are 12″ O.D. Grinding time is 20 minutes floor-to-floor.

fine finishes

.040" stock removal to 6 micro inch finish are requirements for grinding this 32⅝″ long by 13″ O.D. main ram. Floor-to-floor time is 4 hours.



fine finishes



LANDIS TOOL COMPANY / WAYNESBORO, PENNA.

When Your Safety Director Fights for Every Dollar, Respect Him—

He Can Save You

Many More in Preventing Accidents Like This!

A rock drill operator in a silver and lead mine lost the sight of one eye when struck by a rock chip dislodged by his drill. A court awarded $2,755. Pity of it is that a quality Chipper's Goggle costing only about $2.30 would have prevented this accident. The mine management would be ahead by $2,753.70 plus medical and other hidden costs — and the miner would still have his eye.

To prevent these *unnecessary* high costs, more and more managements are putting the job of accident prevention in the hands of a specialist — and *backing him up!* He can pay for his salary many, many times over in the accidents he prevents and the quality of the protective equipment he recommends . . . in eye protection, safety clothing or respiratory protection. For instance, when he recommends an AO† Eye Protection Program, he *knows* you'll get a better break on insurance costs, save on idle machine charges, and take no chances on key workers being knocked out and slowing up production. He knows you'll improve workers' morale, also. Ask an AO Safety Representative to call with all the facts.

†T.M. Reg. by American Optical Company

Always insist on the AO trademark on safety lenses and frames.

American Optical
SAFETY PRODUCTS DIVISION

One of AO's new F5100 Series metal Safety glasses with "Ultrascopic Vision" Write for illustrated brochure.

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

ANOTHER EXAMPLE OF VICKERS® Hydraulics

LeBlond Automated Crank Turning Equipment completely turns and faces over 55 V8 crankshafts per hour. One operator can handle two such machines.

in AUTOMATION

This new LeBlond Automated Crank Turning Equipment machines crankshafts at an exceptionally high rate. All operations of the Models LBA and PBA machines shown above are hydraulic with the exception of the actual rotation of the crank . . . here a Vickers hydraulic motor is used for braking and jogging the electric motor drive. All hydraulic power is supplied by Vickers Pumps and controlled by Vickers Valves.

In addition to the advantages inherent in hydraulic control, Vickers Hydraulics gives you the benefits of a nation-wide and full-time field engineering and service organization to assure correct application and operation with least maintenance. Vickers has the complete line of hydraulic equipment necessary to take undivided system responsibility . . . to eliminate any risk of incompatibility of hydraulic components.

The Vickers Application Engineer near you will be glad to demonstrate the many benefits you can obtain by using Vickers Hydraulics. Write for a copy of Catalog 5001A.

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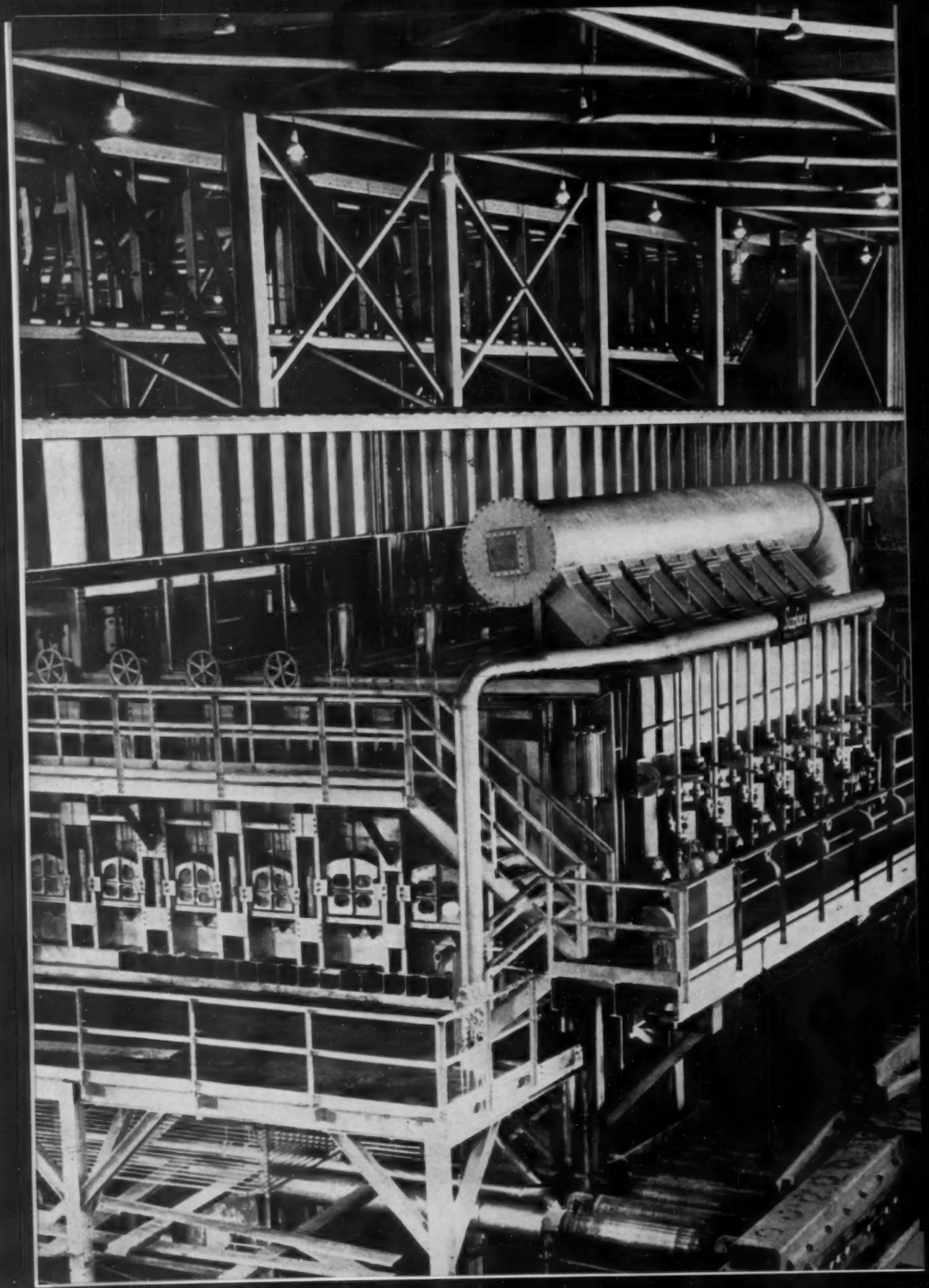
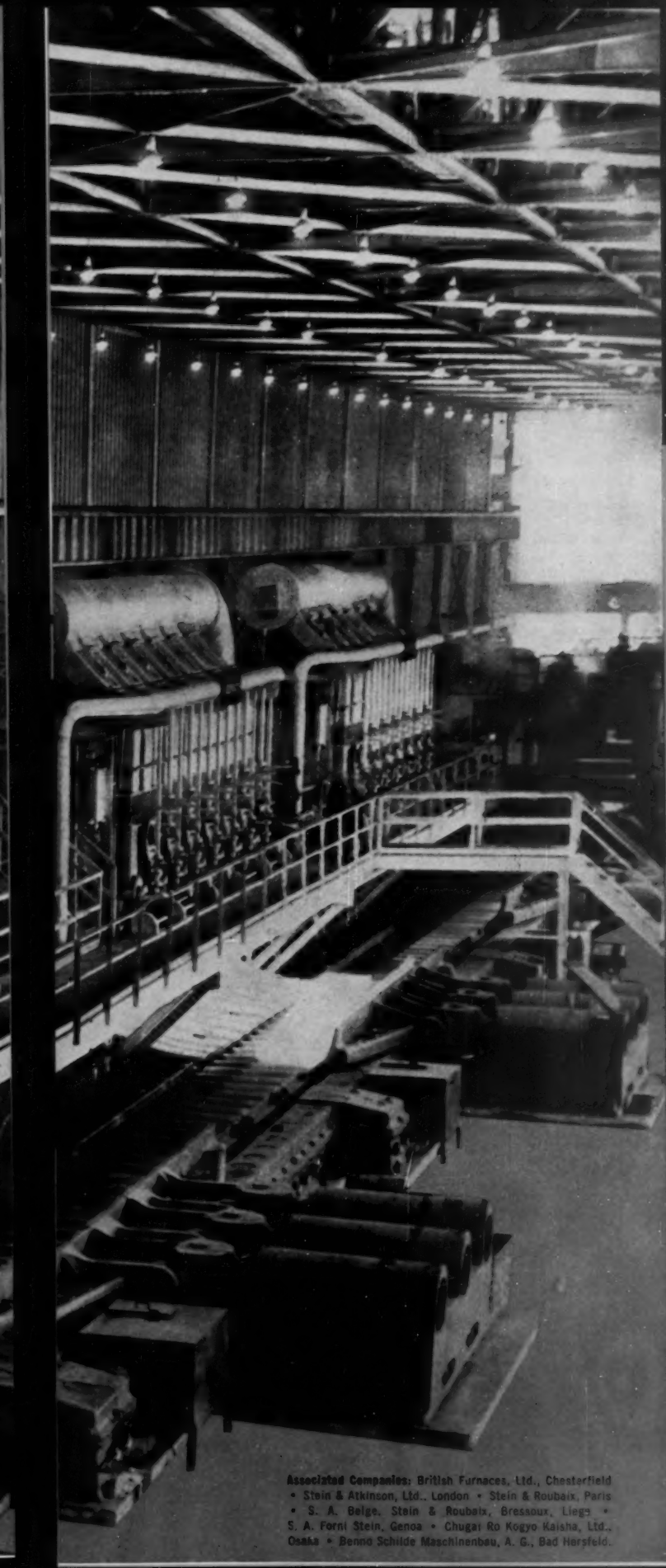
7301

Representative Standard VICKERS Units Used on LeBlond Automated Crankshaft Lathe

Two-Pressure Balanced Vane Pump | "Hydrocushion" Type Sequence Valve | Pressure Reducing Valve | Solenoid Controlled Pilot Operated 4-Way Valve | Flow Control Valve | Traverse and Feed Cycle Control Panel | Constant Displacement Piston Type Hydraulic Motor | "Compact" Hydraulic Cylinder

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921





200 TONS AN HOUR CONTINUOUSLY

200 tons of steel slabs are heated to rolling temperature every hour, continuously, in each of these Surface monsters—world's largest slab furnaces.

No other furnace today can list all of these features:

1. Cantilever skid supports* permitting unobstructed combustion space for underfiring.
2. Furnace lines and burner design which provide high heat input from the moment the slab enters the furnace.
3. Built-in control* to prevent intermingling of gases from upper and bottom zones, providing better control of heat application, and preventing overheated slab end.
4. Anticipatory control which reduces temperature head when rate of slab discharge decreases.
5. Air preheat up to 1100°F.
6. Television signal to pusher pulpit, informing operator of the exact position of the leading slab.

About the only conventional feature in these giants is the fact that the slabs are pushed in one end and out the other.

This is another demonstration that, at Surface, unconventional thinking and conventional experience are a productive team for the steel industry. Surface Combustion Corporation, Toledo 1, Ohio.

*patents pending

Surface
STEEL MILL EQUIPMENT

Associated Companies: British Furnaces, Ltd., Chesterfield • Stein & Atkinson, Ltd., London • Stein & Roubaix, Paris • S. A. Belge. Stein & Roubaix, Bressoux, Liege • S. A. Forni Stein, Genoa • Chugai Ro Kogyo Kaisha, Ltd., Osaka • Benno Schilde Maschinenbau, A. G., Bad Hersfeld.

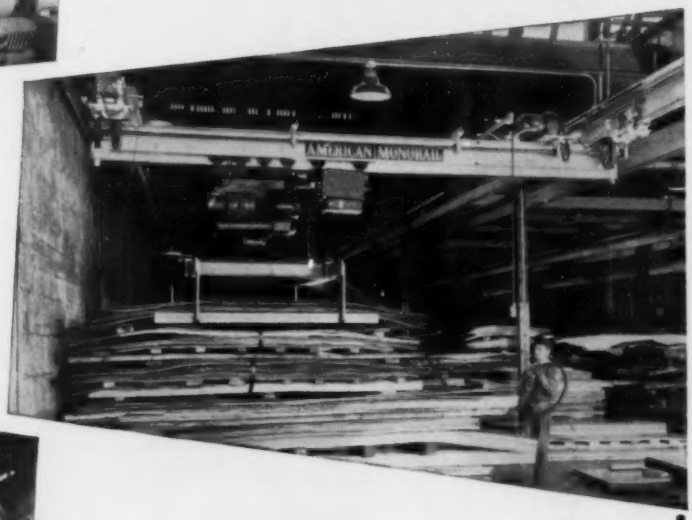
use

MONORAIL SPECIFICATIONS

for

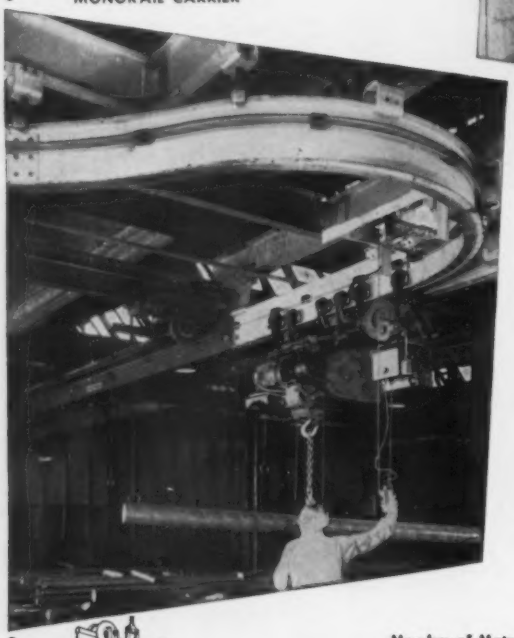
MAXIMUM SAFETY MINIMUM MAINTENANCE

MONORAIL TRACK



MONORAIL CRANE

MONORAIL CARRIER



By following the guide prepared by members of the MonoRail Manufacturers Association when purchasing materials handling equipment, you are assured of getting maximum safety and minimum maintenance and still satisfy your operating requirements.

The guide represents the efforts of the combined experience of all the engineers of the association members. The specification guide has just been published.

A copy of these specifications will be forwarded on request. Write also for a copy of the American MonoRail Bulletin C-1 describing hundreds of successful solutions to handling problems.

Member of Materials Handling Institute — MonoRail Association

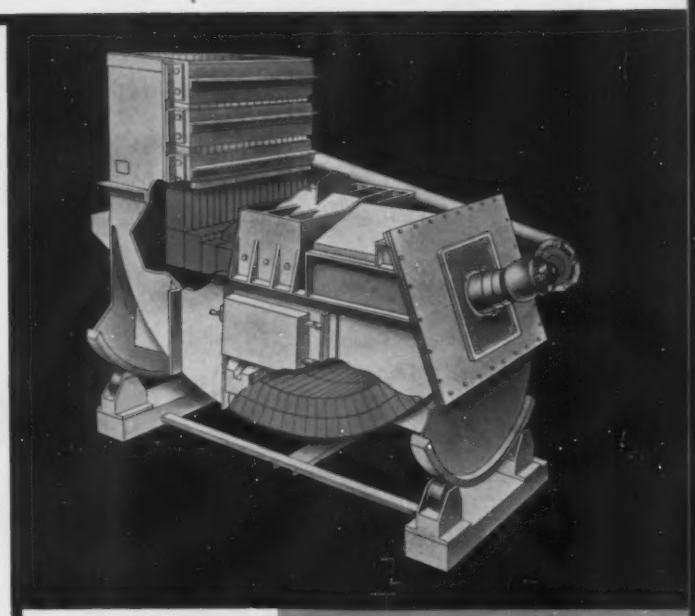
AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

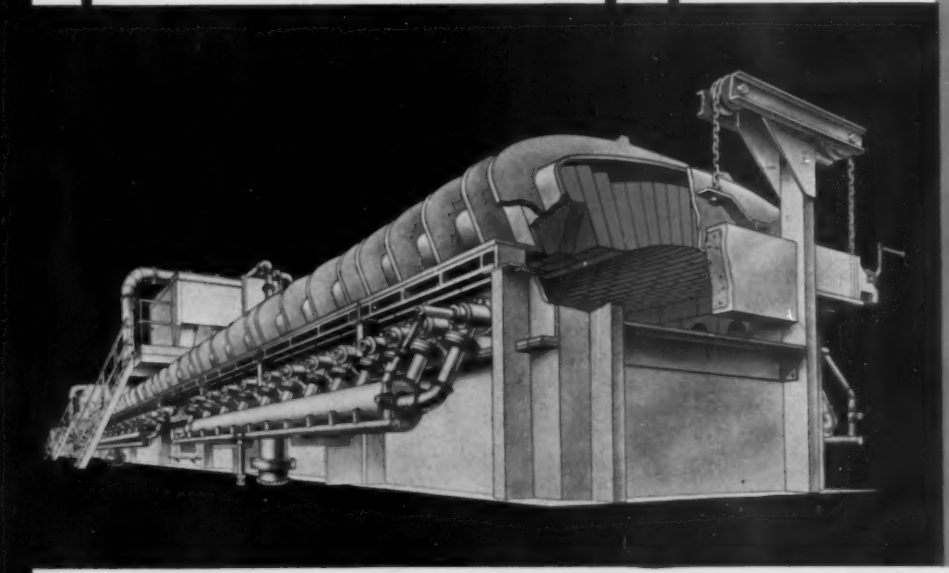
13103 ATHENS AVENUE
CLEVELAND 7, OHIO

[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

Why B&W Allmul Firebrick withstand punishing service in furnaces like these



▲ Direct-fired reverberatory furnace for melting brass, aluminum, and iron. For longer refractory life, B&W Allmul Firebrick are used to line the bath and arch.



◀ In this type of furnace for continuous high speed heating of strip for welding into pipe, temperatures in excess of 3000 F are common and the atmosphere is contaminated with iron oxide. Because of their resistance to spalling and metal penetration, B&W Allmul Firebrick have set new standards for refractory life in bungs, burner blocks and recuperators.

B&W Allmul Firebrick stand up under extremely high temperatures at continued high rates of operation because they are produced from electrically melted mullite grain by a highly efficient process. These top-quality brick have high hot-load strength, high resistance to spalling, good volume stability and a melting point of 3335 F.

They are practical from a cost standpoint for a wide range of applications in the ferrous and non-ferrous metal industries. Illustrated on this page are a butt-weld furnace as well as a direct-fired reverberatory furnace. Other services are direct and indirect-arc electric furnaces, air furnaces, furnace hearths subject to iron oxide scale attack, crucible melting units and furnaces melting many non-ferrous metals and alloys.

Your B&W representative can show you how B&W Allmul can lower your refractory costs in many heavy-duty services. Consult him or write for Bulletin R-34A, giving data on B&W Firebrick for exacting services.

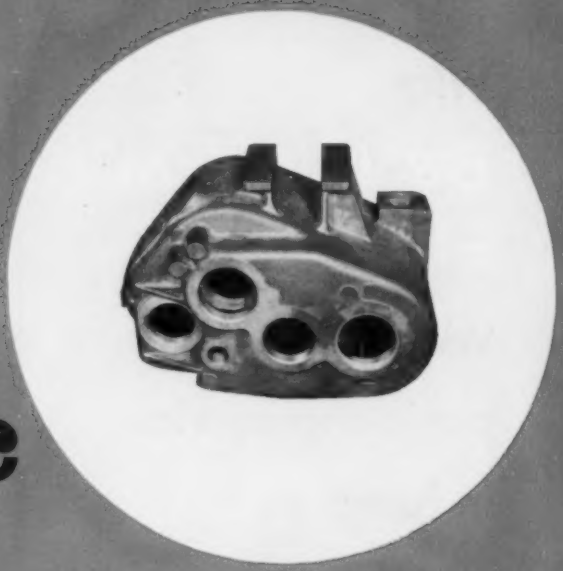
B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide

BABCOCK & WILCOX

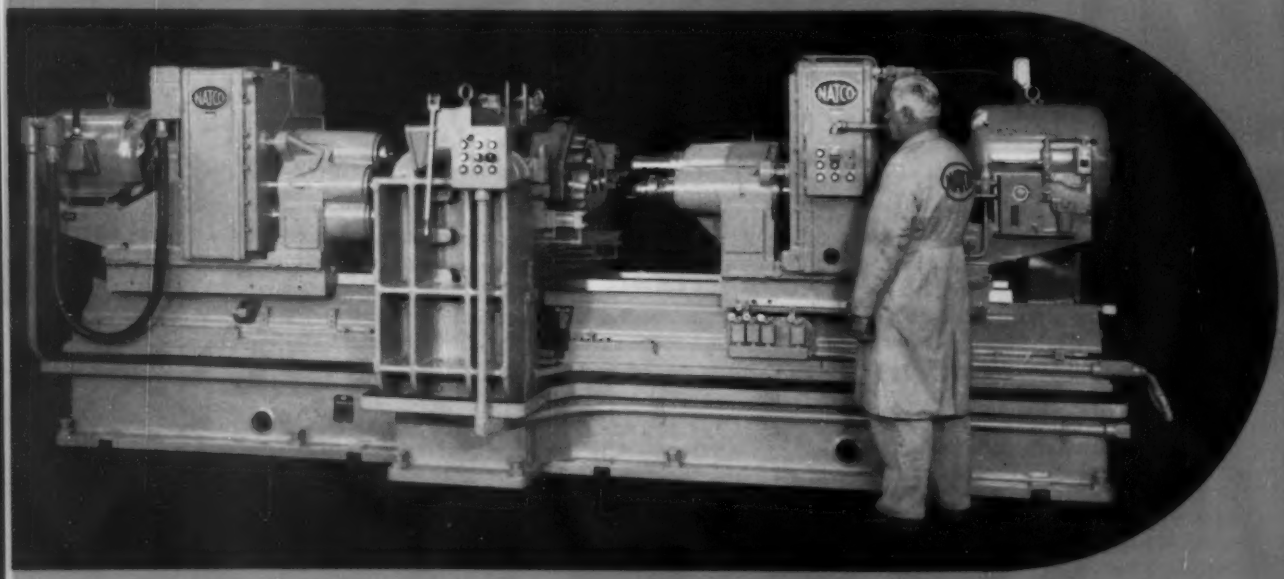
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

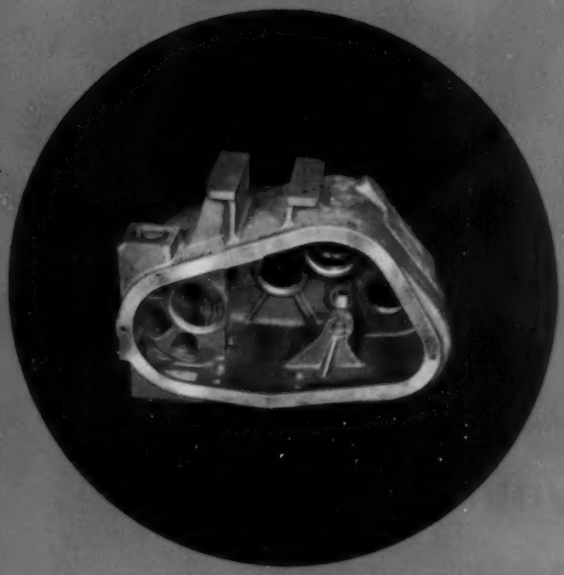
R 887

Natco® Automatic Matches Boring Mill Accuracy



and quickly converts for five different jobs





This Natco two-way machine stepped in where automatics "fear to tread!" It replaced a precision boring mill, speeded production and didn't give up a tenth in accuracy! At The Frank G. Hough Co. boring mills were used for exacting tolerances on transmission parts for the Hough Payloader®. Higher production was desired.

Now with a Natco two-way automatic, Hough is getting production rates—not job shop rates. The Natco bores diameters to within .0005"—square with mounting face within .0005" per inch bore length. The machine also chamfers, counterbores and notches boss contours.

Versatile too! Hough processes five different transmission housings or covers with a single machine. After a typical production run averaging 100 parts, the machine is quickly converted to another job.

Ask for information about the PAYD (Pay-As-You-Depreciate) Finance Plan.

National Automatic Tool Company, Inc. *Richmond, Indiana*

Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

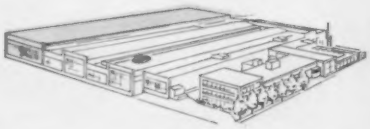
Call Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

NATCO

Notes from Natco...

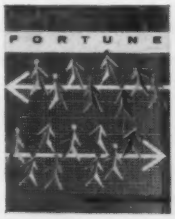
Middle Age Spread

Having reached the age of 55 feeling as spry as the day we started, we at Natco are going to spread out. The demand for our products makes this necessary since we're anxious to give our customers the kind of deliveries they need.



After Jan. 1, 1957, when the job is finished, we'll have eight acres under one roof at our Richmond, Indiana plant. We figure it will increase our production capacity about 50%.

To take care of the increased need for Sales Service, we've already increased our staff about 50% and provided them with new efficient quarters.



Appreciating Depreciation

Depreciation, we've come to realize, is one of the least understood and most important aspects of the business picture today. Though we're far from experts on the ins and outs of this complex subject, we've undertaken to discuss the importance of looking at depreciation realistically in our current FORTUNE campaign. We'll be happy to send you reprints if you'll drop us a line.

KENNAMETAL

K7H

has a definite place in your operations

- for high-velocity machining
- for cutting heat-treated steels
- for cutting high tensile steels

Kennametal* Grade K7H is being selected by shop after shop for high-velocity cutting operations . . . chiefly because of these desirable cutting edge characteristics: High hardness (93.5 Rockwell A) combined with phenomenal strength (three times that of nonmetallics); exceptional wear resistance and maximum resistance to cratering; excellent retention of strength even at high temperatures; and top resistance to shock.

Use Kendex Tooling with turn-over inserts (available in 17 styles and over 200 tools) . . . for lowest cost per cutting edge.

HERE ARE EXAMPLES OF K7H PERFORMANCE

Doubles production: Cutting 1½″ wide stators of welded laminations of 2% silicon steel, K7H has out-performed all other cutting edges by better than two to one, with 147 pieces averaged per index for K7H against only 65 pieces per index with the best competitive carbides. *Conditions:* 900 sfm, .0083″ feed, and .015″ depth of cut. *Results:* Higher total production at end of day, with less machine down time, less scrap, better quality by holding tolerances, and lower tooling cost per stator ($0.00109).

Outperforms ceramics by more than 30 to one in test boring SAE 1020 steel, flash hardened, length of bore 1¼″, depth .025″ at 900 sfm. Grade K7H cut 67 pieces while ceramics only cut two (ceramics chipped). *Result:* K7H ordered for the operation.

K7H cuts 252 pieces as compared to 30 . . . the best record for a competitive carbide in facing cut to dead center of SAE 1018 steel 5″ O.D. gear blank, at 1000 sfm (at outer edge) and .008″ depth of cut. *Result:* Standardized on K7H.

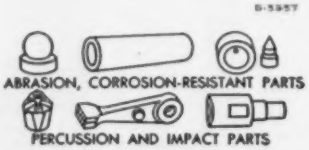
Performance 3 times greater than with competitive carbide cutting cast steel stator housing with six interruptions at 700 sfm, .014″ feed, and ⅛″ depth of cut. *Result:* K7H was selected for the job.

Why not discuss your machining problems with a Kennametal tool engineer. He will help you take full advantage of this remarkable cutting grade. Call him or write KENNAMETAL INC., Latrobe, Pa.

*Registered Trademark

B-5957

INDUSTRY AND
KENNAMETAL
...Partners in Progress



Unitool*. . . *a fast, easy, low-cost way* to produce prototype bevel gears!

Now you can produce small quantities of spiral bevel, Zerol® bevel and hypoid gears with a comparatively small capital outlay and without specially trained personnel.

You can reduce the time and expense it takes to change your angular drive from a drawing board idea to a working model, too, because the Unitool Method produces good quality gears directly from the initial calculations.

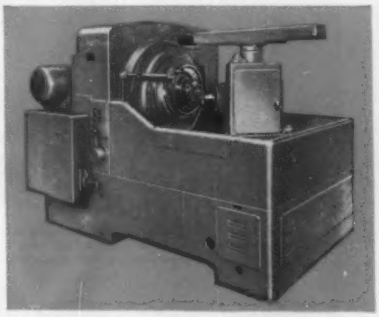
The Unitool Method is based on a fundamentally different theoretical approach to bevel gear generation. Only six different cutters are required to cut gears up to 14" pitch diameter—spiral bevel and Zerol bevel pairs of any ratio; hypoid pairs 3:1 ratio and higher. Because these cutters have a wide overlap in range, cutter diameter is not critical.

Calculations are short enough and easy enough for you to do in your own plant. Correct tooth thickness and position of contact are easily determined without requiring special operator training.

The Unitool Method is designed especially for the Gleason No. 106 and No. 116 Hypoid Generators which feature increased universal cutter tilt.

*Trademark

We will be glad to send further information on the Unitool Method and the two Gleason Generators best suited for it at your request.



The Gleason No. 106 Hypoid Generator is a high-speed machine for spiral bevel, Zerol bevel and hypoid gears up to 8½" pitch diameter. Its larger counterpart, the No. 116 Hypoid Generator, handles the same type gears up to 18" pitch diameter.

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH

STRAIGHT-LINE PRODUCTION ON THE ROOF

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

Above is the 700-Foot Long Self-Housed Finishing System Planned, Engineered and Built by Mahon on the Roof of the Whirlpool-Seeger Corporation's Marion Division Plant, Marion, Ohio. Much of the housing in this installation is an integral part of the Finishing Equipment.

Mahon Seven-Stage Metal Cleaning and Rust Proofing Machine installed in the Self-Housed Mahon Finishing System illustrated above. Ample space is provided for attendant on operating side.

Mahon Oven Control Cabinet, which houses Temperature Recorder, Air Flow Switches and other Safety Control Devices, is shown at left. Mahon Oven Heating Unit appears in foreground.

Pinched for Space Inside? . . . there's LOTS of SPACE ON THE ROOF!

Here's a typical example of straight-line finishing production unfettered by restrictions normally encountered inside manufacturing plants. This Finishing System was planned, engineered and built by Mahon on the roof of the Whirlpool-Seegar Corporation's Marion Division Plant, Marion, Ohio . . . it was built on the roof because suitable space inside the plant was not available. In the 700-foot long enclosure, which is permanent construction, are housed a Seven-Stage Metal Cleaning and Rust Proofing Machine, a Dry-Off Oven, a Cooling Tunnel, a Flow-Coater and Vapor Conditioning Chamber, Reinforcing Booth and Filtered Air Supply System. The Finish Baking Oven, which was already in place, was rebuilt by Mahon with three new Heating Systems. This is a Mahon solution of a problem confronting one manufacturer. If you have a finishing problem, or are contemplating new finishing equipment—for either Electrostatic Coating, Spray Painting, Flow-Coating or Dip-Coating—you, too, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements. No matter what your finishing job may be, you'll find that Mahon equipment will serve you better . . . because, Mahon equipment is engineered better and built better for more economical operation over a longer period of time. You can rely on Mahon to do the complete job on one contract—undivided responsibility for the entire system insures proper coordination, and safeguards you against complications which may upset your production schedules. See Mahon's Insert in Sweet's Plant Engineering File, for information, or write for Catalog A-656.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

CUT COSTS FROM BARREL TO BEARINGS...

Change lubrication methods from

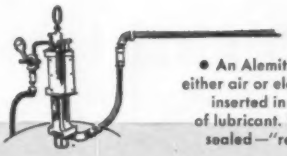
Backward to Forward!

ALEMITE "POWER HOUSE" BARREL PUMP

saves 95 man-hours for every 400-lb. drum of lubricant you use

Lubricating hundreds of bearings by slow, outgrown hand methods is a costly waste of time and money. A modern Alemite "Power House" Barrel Pump does the job much faster—at less cost. You save 95 man-hours for every 400-lb. drum of lubricant used. And because a completely sealed Alemite Barrel Pump system gives cleaner, more efficient lubrication, you make big savings right down the line. Savings in less down-time, and lower maintenance costs . . . in greater efficiency and output.

Air-powered Alemite Barrel Pumps fit directly into either a 400- or 120-lb. drum, send lubricant wherever it is needed anywhere in the plant. Or drum and pump can be placed on a dolly to go right to the machines. You get the big advantage of a completely sealed system. Lubricant reaches bearings "refinery clean"—no mess or waste.



• An Alemite Barrel Pump, either air or electric powered, is inserted in a fresh drum of lubricant. Lubricant is still sealed—"refinery fresh."

• Now the Barrel Pump supplies lubricant, through pipe, anywhere in the plant. Operator simply carries a hose and control valve to outlet, hooks it in, applies lubricant.

• Where piping of lubricant is not practical, power lubrication can be brought right to the machine by simply mounting drum and pump on a dolly.

FREE! New Booklet:
"5 Plans for Better Lubrication"

Alemite, Dept. N-76, 1850 Diversey Parkway
Chicago 14, Illinois

Please send me my FREE copy of "5 Plans for Better Lubrication."

Name .....

Company .....

Address .....

City ..... Zone ..... State .....

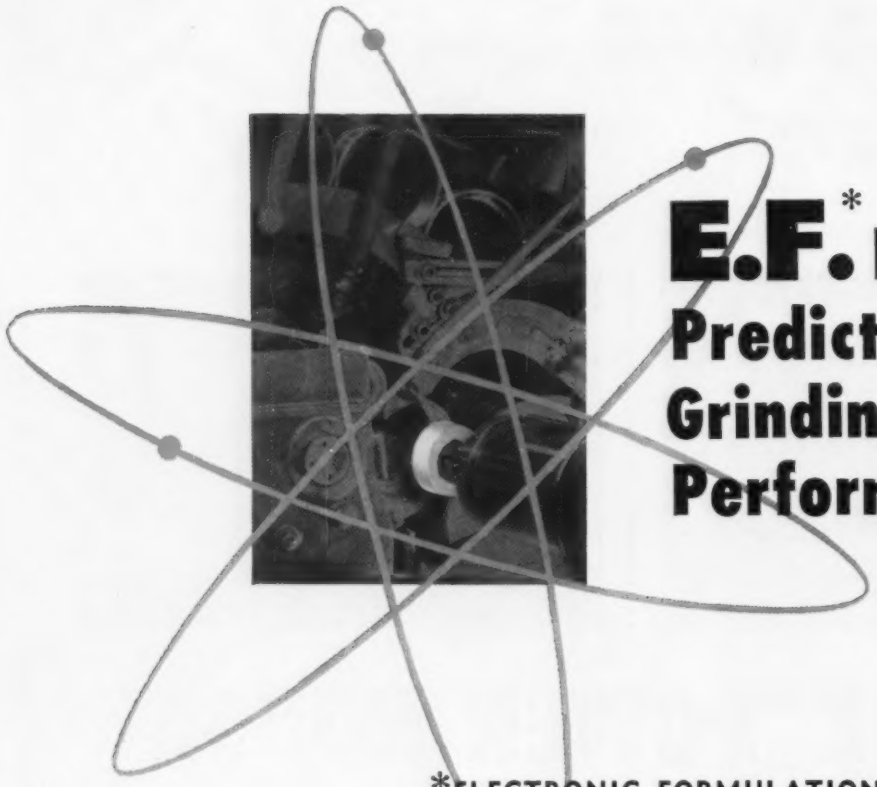
ALEMITE

REG. U. S. PAT. OFF.

BARREL PUMPS

Products of STEWART-WARNER CORPORATION

STEWART SW WARNER



E.F.* Lets You Predict Grinding Wheel Performance!

***ELECTRONIC FORMULATION** is a new, fundamental manufacturing system. It has established the most accurate standards and techniques by which grinding wheels can be specified, produced, and reproduced. Its new precision applies to all types of grinding wheels as well as to other abrasive products.

Designed and Developed to take full advantage of modern electronic equipment, the "EF" system determines the precise amount of each ingredient. It does this rapidly and flawlessly. The results form a dependable basis for rigid manufacturing control, and are automatically retained on punched cards.

For Your Production Grinding, this means an entirely new degree of dependability, in three important ways. First, original "specs" can be more accurately pin-pointed for your work. Second, "EF" wheels can be more precisely manufactured to match these "specs". Third, replacement wheels can be much more nearly identical in cutting characteristics. "EF" lets you *predict* grinding wheel performance, the key factor in controlling your production grinding to match your production needs.

Ask your local BAY STATE DISTRIBUTOR about these important **"EF"** *advantages.*

BAY STATE ®
WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U. S. A.
Branch Offices and Warehouses — Bristol, Conn.; Chicago, Cleveland, Detroit, Pittsburgh. Distributors — All principal cities.
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

PROOF OF LIMA QUALITY

"A versatile, fast-moving wagon mounted LIMA Crane solved our materials handling problem"

reports R. E. Fisher, President, The Bonney-Floyd Co.

Back in 1949, the Bonney-Floyd Company, Columbus, Ohio, foundry, faced a growing materials handling problem. Increasingly diversified production called for a wide variety of casting flasks to be stored in large quantities in the plant yard. They picked a wagon mounted Lima Type 34 crane to solve the problem of handling and stacking the flasks.

Bonney-Floyd's president, Mr. R. E. Fisher, states: "We found that the Lima gave us greater storage flexibility . . . compared to such alternate facilities as a fixed overhead runway crane. The Lima's mobility made possible a storage arrangement with convenient separation of sizes, types and quantities of flasks. The machine's excellent travel speed is important because storage is spread over a large area."

Mr. Fisher concludes, "Six years of efficient, trouble-free service have proved our Lima the ideal answer to our yard materials handling problem. We've even been able to use it effectively for such *extra* jobs as unloading gondola cars, transferring loaded trailers and lifting materials for casual structural work."

If *you* have a materials handling problem, it will pay you to check the complete line of wagon, truck or crawler mounted Limas . . . designed and built with the emphasis on quality to give *you* perfect performance on every job. See your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

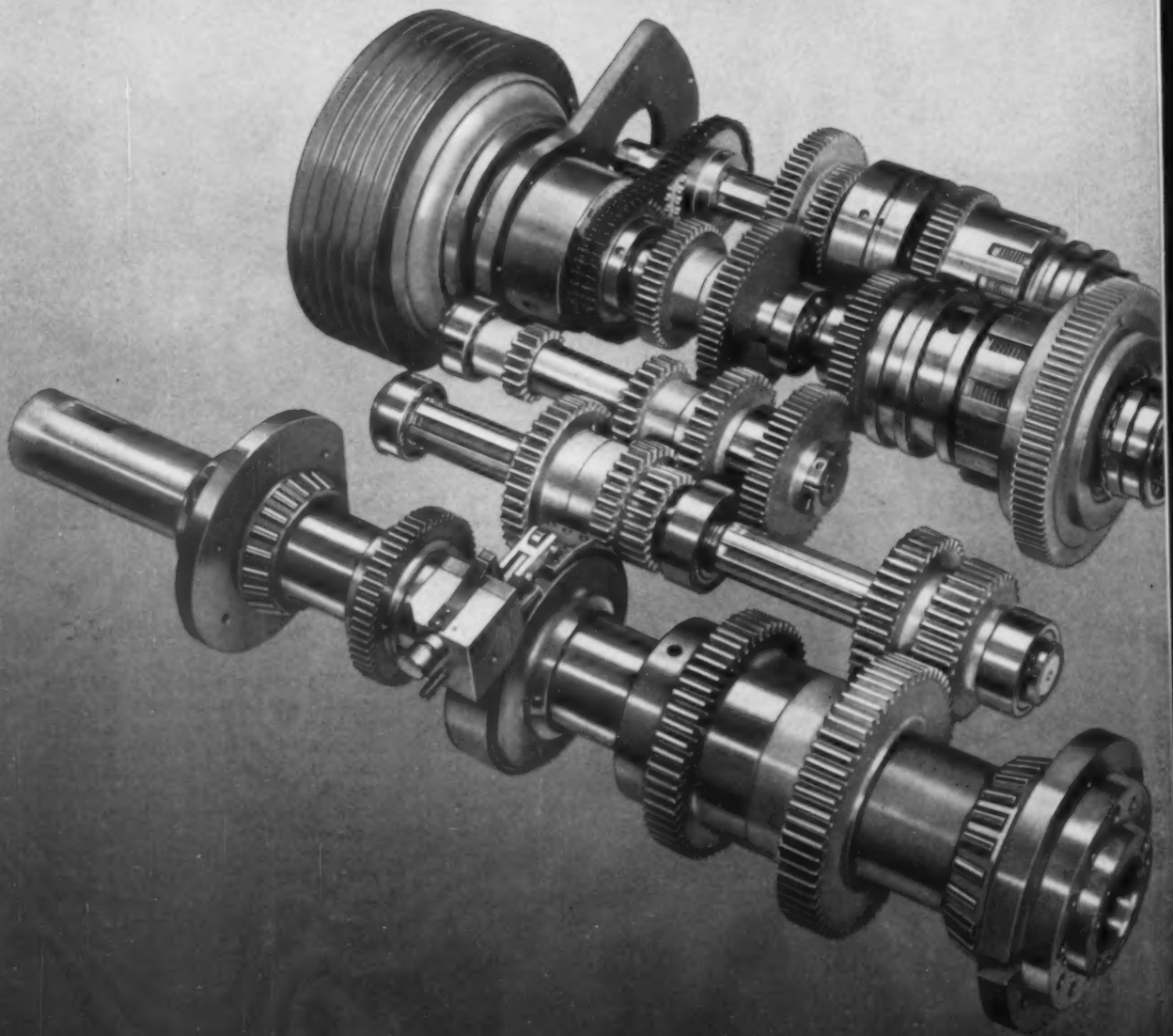
BALDWIN-LIMA-HAMILTON

Construction Equipment Division—LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

The **power reserve** *and* **range of speeds**

YOU'LL NEED FOR THE



TOOLS OF TOMORROW

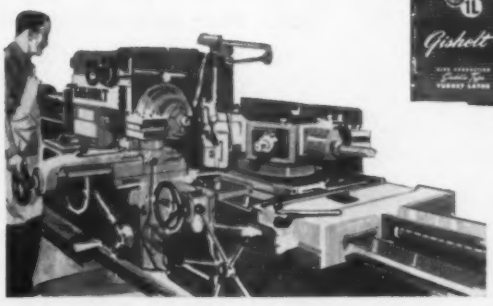
New GISHOLT MASTERLINE SADDLE TYPE TURRET LATHE

WANT MAXIMUM OUTPUT AND ACCURACY from today's carbide tools—with an ample reserve of power and speeds to meet tomorrow's tooling requirements?

That's what you'll get—*now*—from this powerful, rugged Gisholt MASTERLINE Saddle Type Turret Lathe. Prime example of this machine's advanced features is the rugged Headstock Gear Train, shown at the left. Here, you can get 24 different forward speeds—all from a *single*-speed motor. This means you get *full* power *all* the time—a critically important feature for those heavy cuts at punishing feeds.

But that's not all. To give you maximum performance from this powerful gear train, Gisholt designers have backed it with faster speed changes through the Hydraulic Speed Selector (effortless speed shifts without waiting or computing); a hydraulically operated Hi-Lo speed change in a 6:1 ratio (without stopping the spindle or shifting gears); and a new Self-Adjusting Electric Clutch and Brake (smooth, fast starting and stopping, plus more accurate inching of the spindle).

Ask your Gisholt Representative to give you the complete facts. Why not call him today?



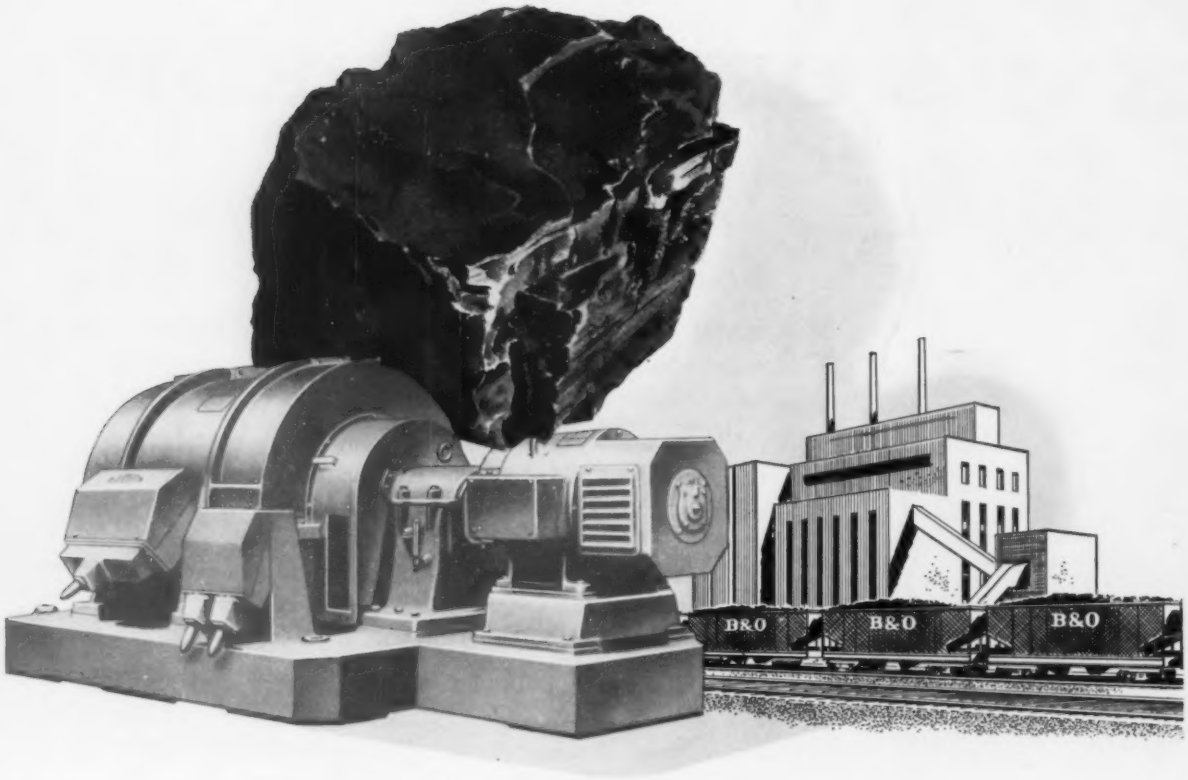
ASK FOR complete set of Gisholt MASTERLINE Saddle Type Turret Lathe Bulletins.

GISHOLT MACHINE COMPANY

MASTERLINE GISHOLT SINCE 1887

Madison 10, Wisconsin, U.S.A.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • PACKAGING MACHINES • MOLDED FIBERGLAS PLASTICS



Energy PRODUCER EXTRAORDINARY!

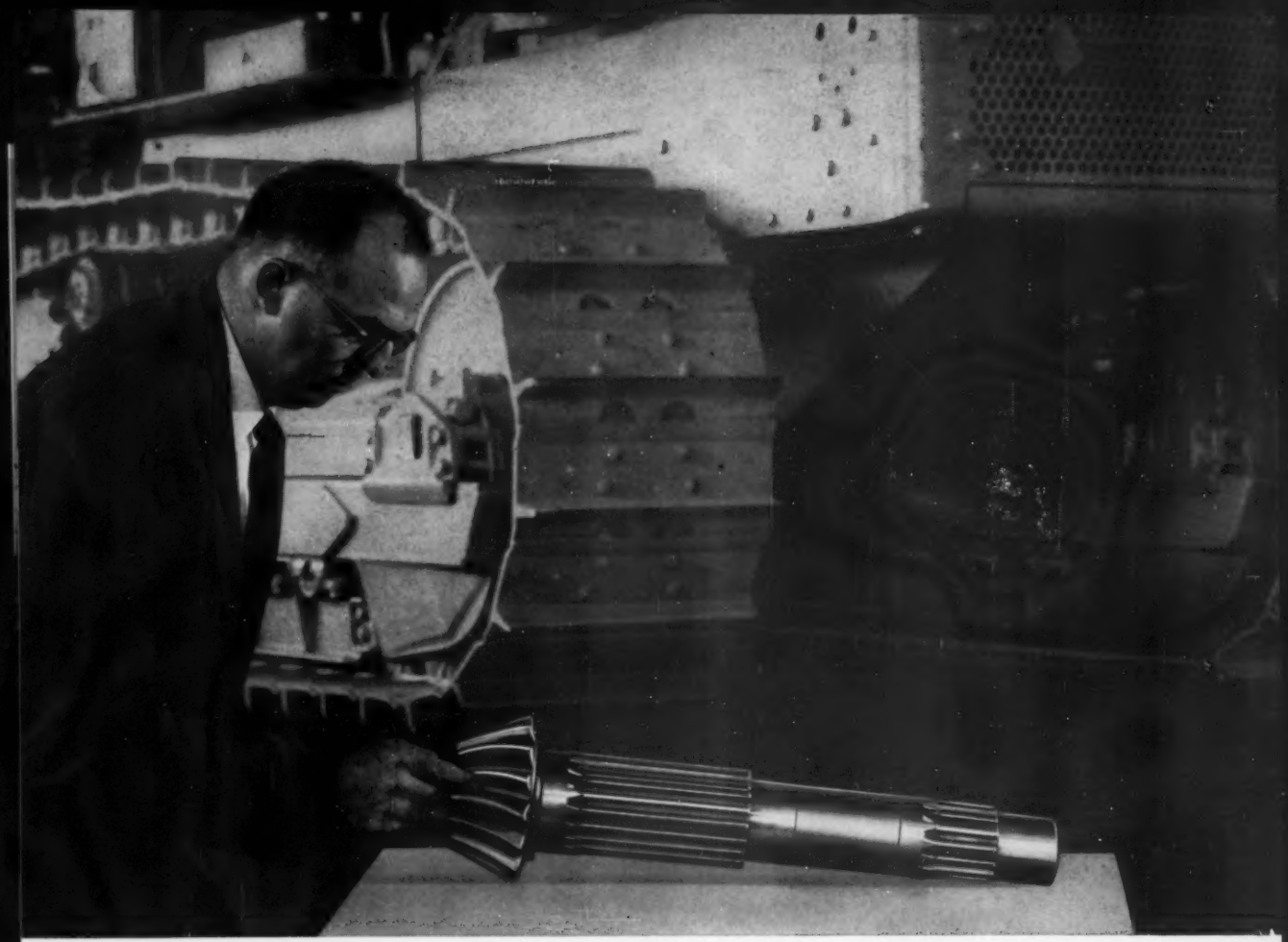
Coal-generated electric power is continually on the increase because Bituminous is economical and abundant. Billions of tons in proved reserves of bituminous for every purpose are available on the B&O. Mines operated with modern efficiency are prepared to provide the right coal for your specific needs. *Ask our man!*

LET OUR COAL TRAFFIC REPRESENTATIVES suggest the B&O bituminous you can bank on. Contact Coal Traffic Department—B&O Railroad, Baltimore 1, Md. LExington 9-0400.

BITUMINOUS COALS FOR EVERY PURPOSE

BALTIMORE & OHIO RAILROAD

BITUMINOUS COALS FOR EVERY PURPOSE



Caterpillar Tractor Co. Metallurgist T. H. Spencer inspects final drive pinion for D9 crawler tractor weighing 28 tons. Severe loading of this large pinion requires a steel with high case and core hardenability. Several years ago Caterpillar Tractor Co. found that simply by increasing the molybdenum content of AISI 8622 (to 0.30-0.40%), the desired properties were obtained at lower cost than was possible in any of the standard carburizing grades.

Caterpillar Tractor Co. improves case and core hardenability of carburizing steel by increasing molybdenum content

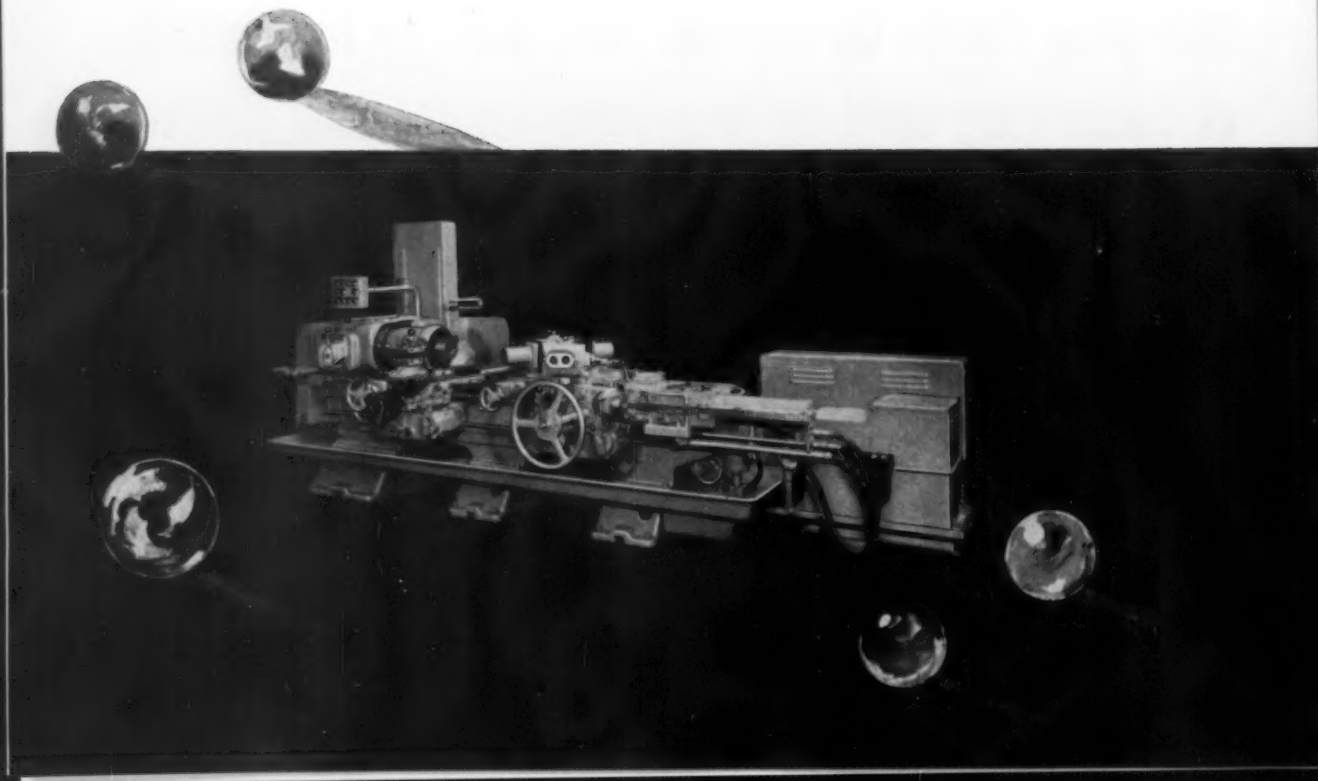
"Drive pinions in tractors must take very high torque loads," says T. H. Spencer, Metallurgist for Caterpillar Tractor Co. "AISI 8622 steel, which we had been using, couldn't give us the hard case and strong, tough core we needed in these heavy sections. Other standard carburizing steels with the requisite properties would have cost substantially more. We found, however, that we could achieve the desired surface and core properties by simply modifying AISI 8622 with a higher percentage of molybdenum. We have been using this composition for several years, and results have been excellent."

Caterpillar Tractor Co.'s experience shows how increasing molybdenum in a carburizing steel helped to solve a specific problem. Perhaps your product, too, can benefit by higher molybdenum content.

A technical article, "New Carburizing Steels for Critical Gearing", describes some recent investigations of higher-moly carburizing steels. For a reprint, write Climax Molybdenum Company, Dept. 2, 500 Fifth Avenue, New York 36, N. Y.

CLIMAX MOLYBDENUM

CHILD'S PLAY



Speed is not enough! To pay for itself out of reduced operating costs and increased profits, today's machine tool must be:

1. Easy to understand. 2. Child's play to operate.

3. Quick to convert in change-over and re-tooling.

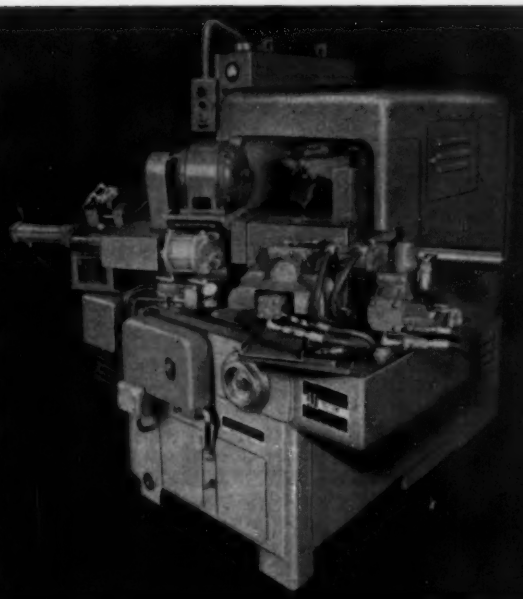
4. Push-button simple to demonstrate in operator training.

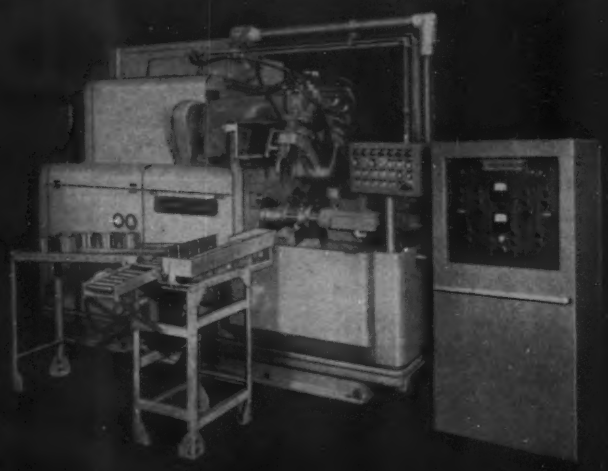
Here are a few of the many advanced engineering features which have made today's Jones & Lamson machine tools the most flexible and cost-efficient metal cutting equipment in the industrial world today.

Two-way tracing combined with normal turret lathe operation; Hydra-clutch headstock and Geneva saddle for simple "on the machine" handling; Automatic handling, gaging, chip disposal, sorting, tool adjustment on single spindle automatics; Tape controlled turret lathes for flexibility on long or short run jobs with pre-set tooling, no hand controls; Thread and form grinders with fully automatic handling and machining cycles; Contour grinders controlled hydraulically or optically, and "Automatic thread chasing on standard turret lathes".

JONES & LAMSON MACHINE CO • 511 CLINTON ST • SPRINGFIELD, VT.

Turret Lathes *Fay Automatic Lathes* *Milling & Centering Machines* *Thread & Form Grinders* *Optical Comparators* *Threading Dies & Chasers*





A 48 x 36 Cecostamp is making road signs, metal ceilings, auto body parts, roofing trim and grain bins at an up-to-date metal stamping concern in Canada.

Formerly made on a rope drop hammer, these stampings as produced on the Cecostamp are sharper and more distinct, production has been increased up to 10% and rejects have been greatly reduced, saving time and material. Operation is also easier and safer.

Have you a stamping problem that might be solved by installing Cecostamps? Investigate this air-operated impact type drop stamp, using blows of controlled intensities, the control being completely and instantly at the will of the operator.

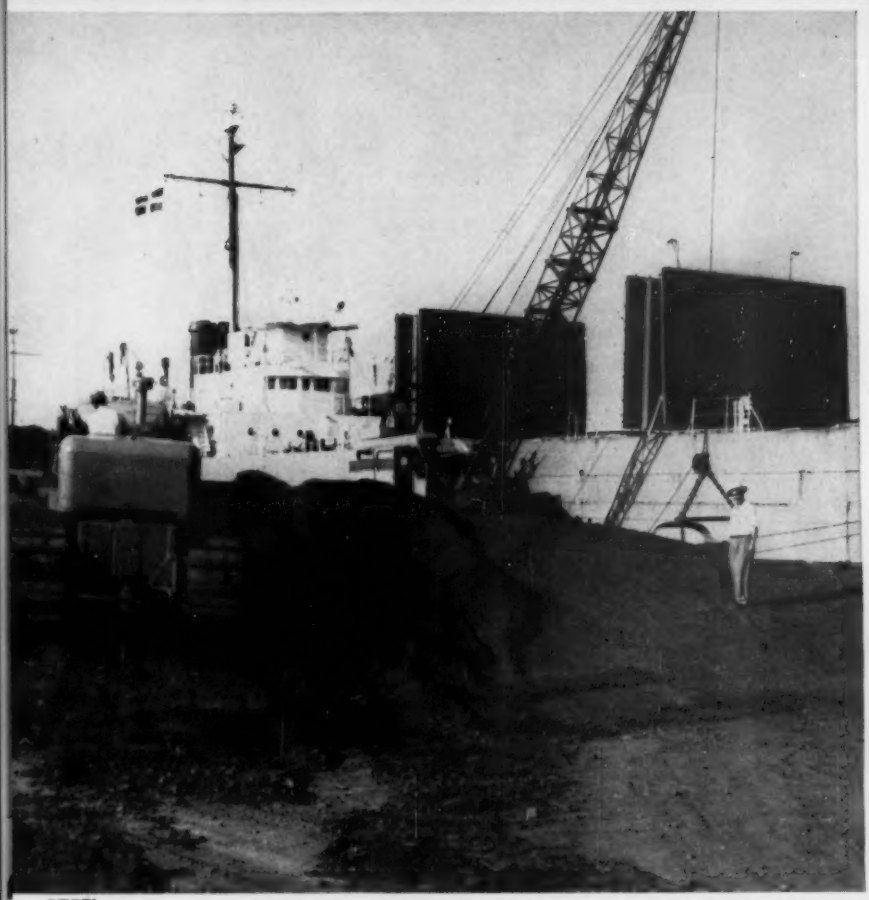
Write for a copy of our latest Bulletin No. 30-L-5

Above are a few of the familiar road signs produced on the versatile Cecostamp.

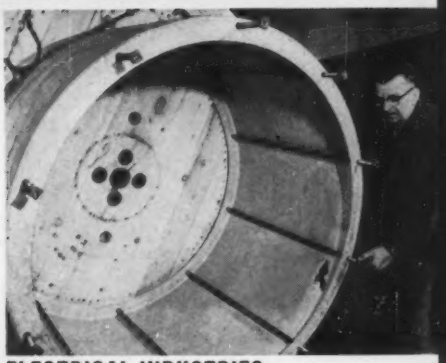
CHAMBERSBURG CECOSTAMP

CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PENNSYLVANIA

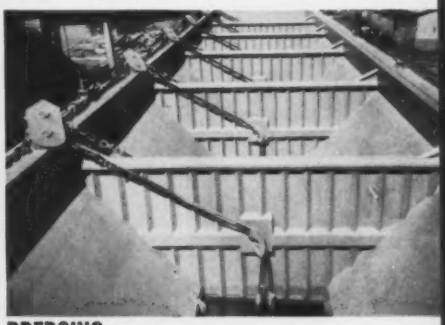
BARIUM STEEL—active in America's growth



STEEL. Rich iron ore from mines in the Dominican Republic is being loaded onto Barium ore carriers here for import. Averaging between 65% and 69% iron, this high-grade ore will go to service Barium's steel-making facilities, as well as adding to the industry's supply of open hearth lump ore.



ELECTRICAL INDUSTRIES are long-time Barium customers. Made at Bayonne Bolt Corp., these ¾" by 44½" long bolts are used by General Cable Corp. of Bayonne to assemble the large cable reels above. Washers on this job come from Phoenix Iron & Steel, another member of the Barium team. Whether you're looking for standard or special fasteners, you'll find them at Bayonne.



DREDGING and harbor transport experts are showing keen interest in this 170' hydraulically-controlled dump scow designed by Barium. Made by Barium's Wiley Manufacturing Co., this one goes to J. Rich Steers Sand and Gravel Corporation of New York, while three more are already on order. Maybe this new design could solve some of your dredging or harbor transport problems.

AUTOMOBILES. Some of the body parts for practically 4 out of every 5 American cars today come from Barium's Cuyahoga Spring Company. In addition to these oddly shaped rods and automotive parts Cuyahoga also specializes in springs and flat fasteners for household appliances. Perhaps this specialized experience could help you.

AIRCRAFT jet engine and guided missile manufacturers come to Industrial Forge and Steel for titanium billet forgings. This Barium subsidiary specializes in titanium and is one of the largest forgers of this new, light, strong, heat-resistant metal. If you're interested in a metal with these characteristics, why not check with Industrial.

6.3

STEEL PRODUCERS

Phoenix Iron & Steel Co. (Plate Div.; Structural Div.; Steel Tube Div.; Blast Furnace Div.)

STEEL FABRICATORS & PROCESSORS

Phoenix Bridge Company • Industrial Forge & Steel, Inc. • Globe Forge, Inc. • The Geometric Stamping Company

A GROUP OF INTEGRATED COMPANIES
BARIUM
STEEL CORPORATION
WORKING IN STEEL, ALUMINUM, MAGNESIUM, FIBERGLASS

This close-knit, alertly managed team of companies will be glad to put its engineering resources and production facilities at your disposal. See a complete product and service listing in Thomas' Register, Section A to Z, or write to:

25 BROAD STREET, NEW YORK 4, N. Y.

MANUFACTURERS OF END PRODUCTS

Clyde Iron Works, Inc. • Erie Bolt and Nut Company • Bayonne Bolt Corporation • The Cuyahoga Spring Company • Jacobs Aircraft Engine Company • Wiley Manufacturing Company

LIGHTWEIGHT METAL AND PLASTICS

East Coast Aeronautics, Inc.

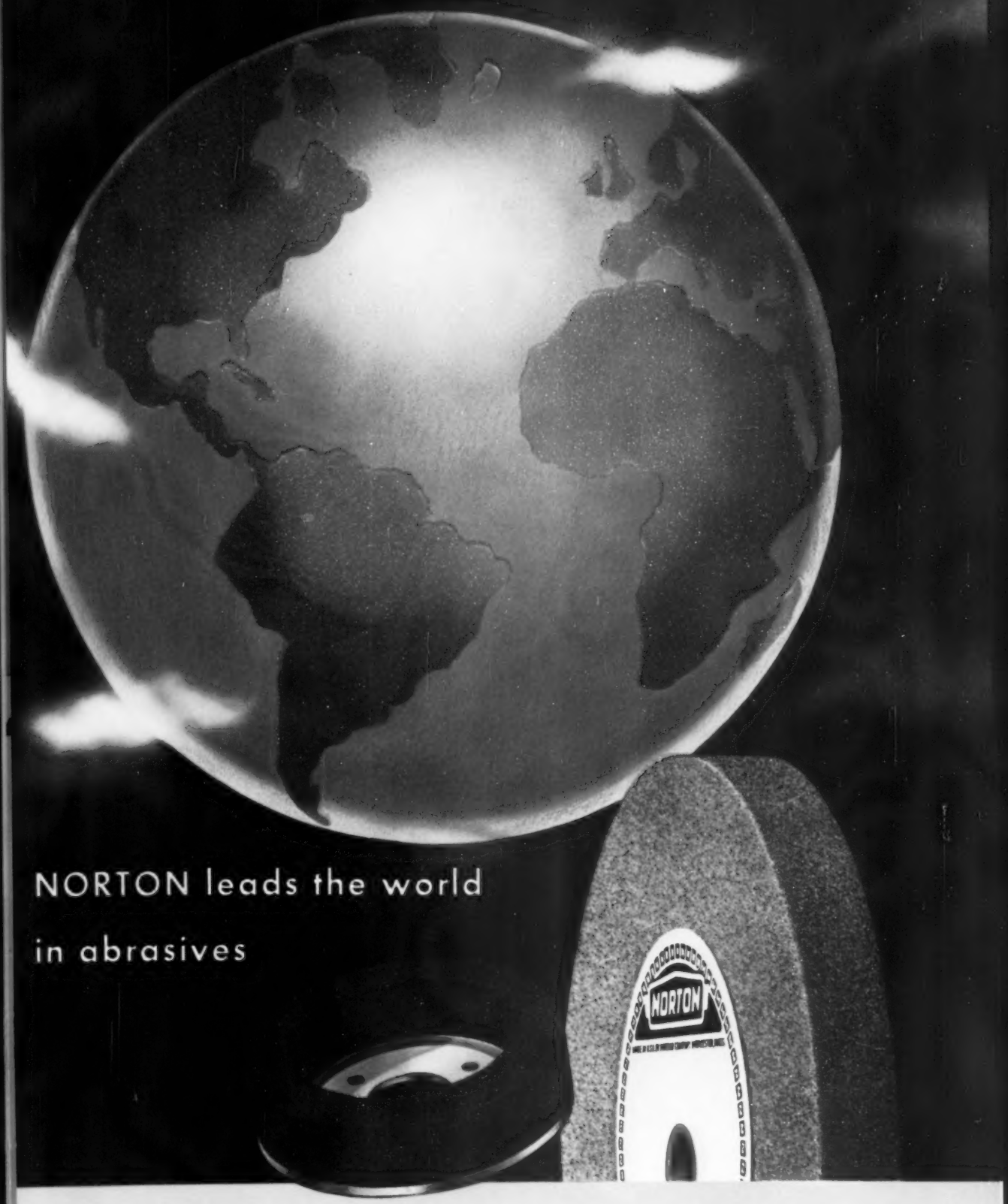
Profit Launcher

Here's how 48¢ worth of Signode steel strapping can tie together 1¼ tons of drain tiles, so that they can be handled and shipped as a unit. This way saves time (and tile) for shipper, receiver and ultimate user. Unitizing with high-strength, low-cost steel strapping works equally well with castings, forgings, ingots, brick, sheets, cartons, products of many shapes and sizes. Your products, too, will cost less to handle, store, ship and receive when unitized the Signode way. Let a Signode representative show you how. Just write:

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-wide.
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto



NORTON
ABRASIVES

Making better products . . . to make your products better

NORTON BRINGS THE "TOUCH of GOLD" TO GRINDING JOBS THE WORLD OVER

THE TRUE "TOUCH OF GOLD" in grinding can happen only when the grinding wheel — or other abrasive product — is doing the best possible job. That is, when it is saving the most time and money — adding the greatest value to the product being ground — and boosting grinding profits to the maximum. These are the benefits built into all Norton abrasives.

And here are some of the ways in which Norton makes sure you can add the "Touch of Gold" to every grinding job you do . . .

THE BROADEST LINE. Norton offers you the widest choice of abrasive products — available in hundreds of thousands of different grinding combinations, so you will get exactly what you need for best production at lowest cost.

EACH NORTON PRODUCT is manufactured to strictest quality control standards. And each is backed by research and development that have produced the greatest number of abrasive advancements in the field. For example: 32 ALUNDUM* abrasive, unequalled for fast, cool cutting action on today's steels . . . G Bond, most efficient vitrified bond ever developed . . . and NORBIDE boron carbide, hardest material made by man on a commercial production basis.

YOUR NORTON DISTRIBUTOR is ready to help you on any grinding problem. His factory-trained specialist will see that you get exactly the right wheel for each job. And your Norton Abrasive Engineer is always available for expert technical consultation. Take advantage of these application aids to better, more profitable grinding.

FAST SERVICE FROM FULL STOCKS. Norton Distributors, in 268 cities in the U. S. A., maintain stocks fully adequate to the needs of each area. They, in turn are backed-up by warehouse stocks in five major industrial areas, and by the vast stocks in the mile-long Worcester plant. Serving customers abroad are 12 Norton plants and scores of Distributors.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
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BEHR-MANNING, Troy, N. Y. is a division of Norton Company

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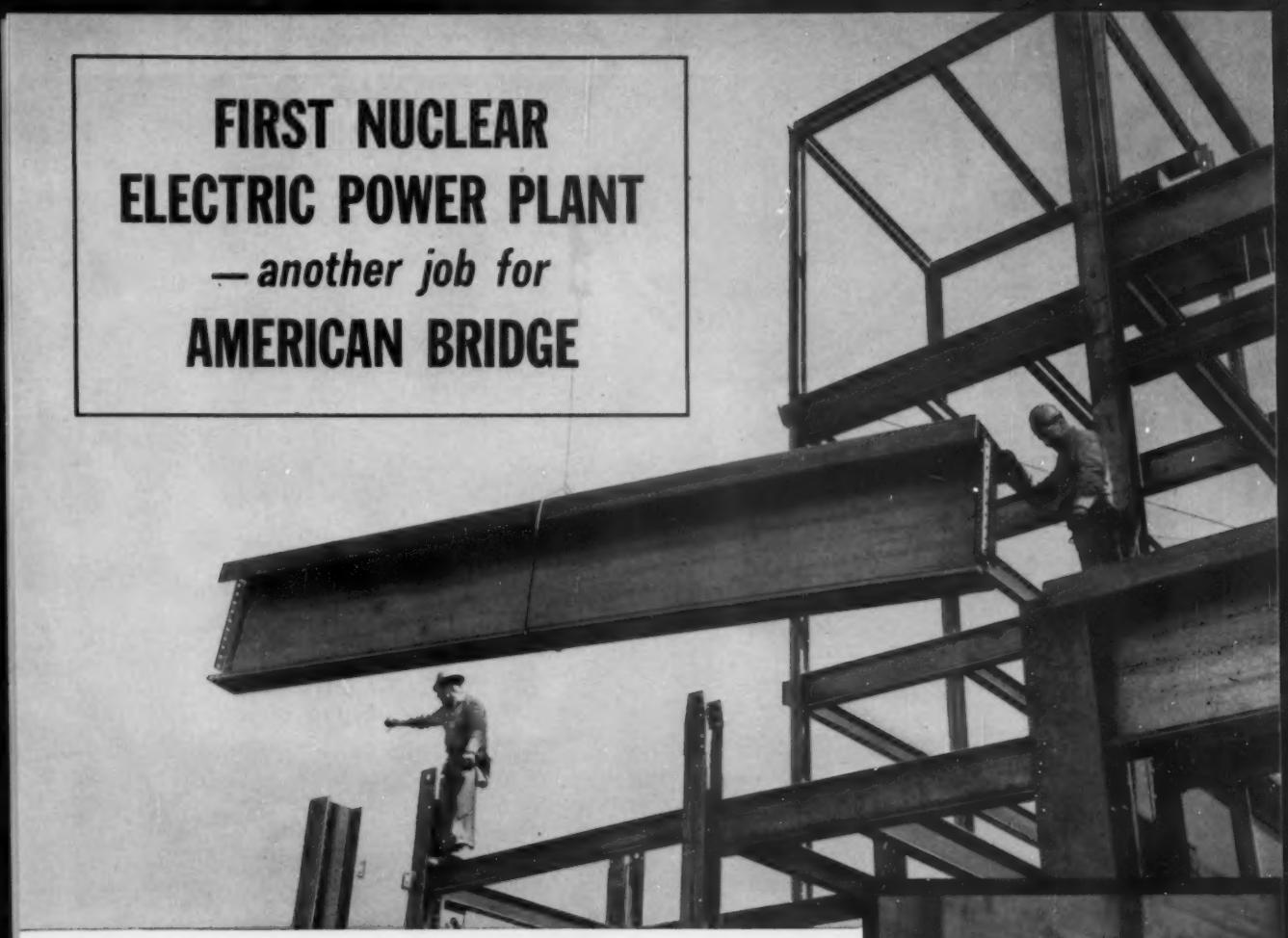
FIRST NUCLEAR ELECTRIC POWER PLANT
—another job for AMERICAN BRIDGE



"1700 tons of structural steel going up on schedule"

reports Superintendent Jim Basden, power plant job veteran

IN his five years as an American Bridge superintendent, young Jim Basden has erected several power plant jobs, including the great Elrama and Phillips Power Plants. Now he is running another power plant job—one that could have a profound effect throughout industry.

It's the Shippingport Power Station of Duquesne Light Company, 25 miles from Pittsburgh, Pa. It features the nation's first full-scale nuclear reactor for producing electrical energy.

The 1700 tons of structural steel which American Bridge is fabricating and erecting for this job is going up on schedule. More than two-thirds of the steel is already in place and Jim Basden's crew will finish the job on schedule.

Working with a 60-ton crane with a 90-foot boom, the experienced American Bridge crew is setting the steel for the three-story turbine room, the six-story service building, the fuel-handling building, the air-treatment building, the reactor plant service building, the foot bridge between the turbine room and screen house, and the turbo-generator supports. Girders in latter weighed 82 tons each, and required a second crane.

Men like Jim Basden and his erection crew, plus the engineers, the fabricating crews, the estimators, and many others bring a wealth of experience to every American Bridge job. This experience, combined with the finest in fabricating and erecting equipment, is available to you for large jobs or small. Call our nearest contracting office.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION • GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.
Contracting Offices in: AMBRIDGE • ATLANTA • BALTIMORE • BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT • ELMIRA • GARY HOUSTON • LOS ANGELES • MEMPHIS • MINNEAPOLIS • NEW YORK • ORANGE, TEXAS • PHILADELPHIA • PITTSBURGH • PORTLAND, ORE. • ROANOKE • ST. LOUIS • SAN FRANCISCO • TRENTON
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN BRIDGE

USS

UNITED STATES STEEL

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METAL STRIPPERS

"ALUMON" for Plating on Aluminum

RUST REMOVERS

RUST PROOFING COMPOUNDS

ENAMEL STRIPPERS

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WORLD-WIDE DISTRIBUTION
. . . ALSO IN
Canada, Brazil, England, France, Sweden and Germany

Since 1930, ENTHONE Incorporated has developed and brought to the metal finishing market many specialty products and processes. Often these products have provided the answers to finishing problems previously unsolved. ENTHONE ENSTRIPS, for example, are patented products for the selective dissolving of one metal plated on another without attacking the base metal.

ENSTRIP A — U.S. Patent No. 2,649,361 — was the first product ever offered for dissolving nickel plate without attack on the steel basis metal.

ENSTRIP 165-S — U.S. Patent No. 2,698,781 — was the first product ever offered for dissolving nickel from copper base alloys without attack on the basis metal. And there are many other selective strippers in the ENSTRIPS group to meet all requirements.

If you have a metal finishing problem, ask ENTHONE *first!* Write now for the folder "They are HERE . . ." describing **20** ENTHONE answers to difficult finishing problems.

ENTHONE INCORPORATED

442 ELM STREET, NEW HAVEN 11, CONNECTICUT

Metal Finishing Processes • Electroplating Chemicals

Braze it for 4¢ with TOCCO*

Willey's Carbide Tool Company, Detroit, reports the following benefits from TOCCO *Induction Brazing* of tool tips:

1. ***Large lathe tools:*** **8 times as fast.** ***TOCCO brazes 85 per hour; former method 80 per day.***
2. **Cost cut from 58¢ to 4¢** ***for each large tool.***
3. ***Small tools (¾" to ¼" square):*** **TOCCO brazes 250 to 400 per hour.**
4. ***Two 15-KW TOCCO machines*** **paid for themselves in three months.**

Mail coupon for information on many other brazing applications where TOCCO saves important time and money.

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. A-7, Cleveland 5, Ohio

Please send copy of "Tool Tipping with TOCCO."

Name_____

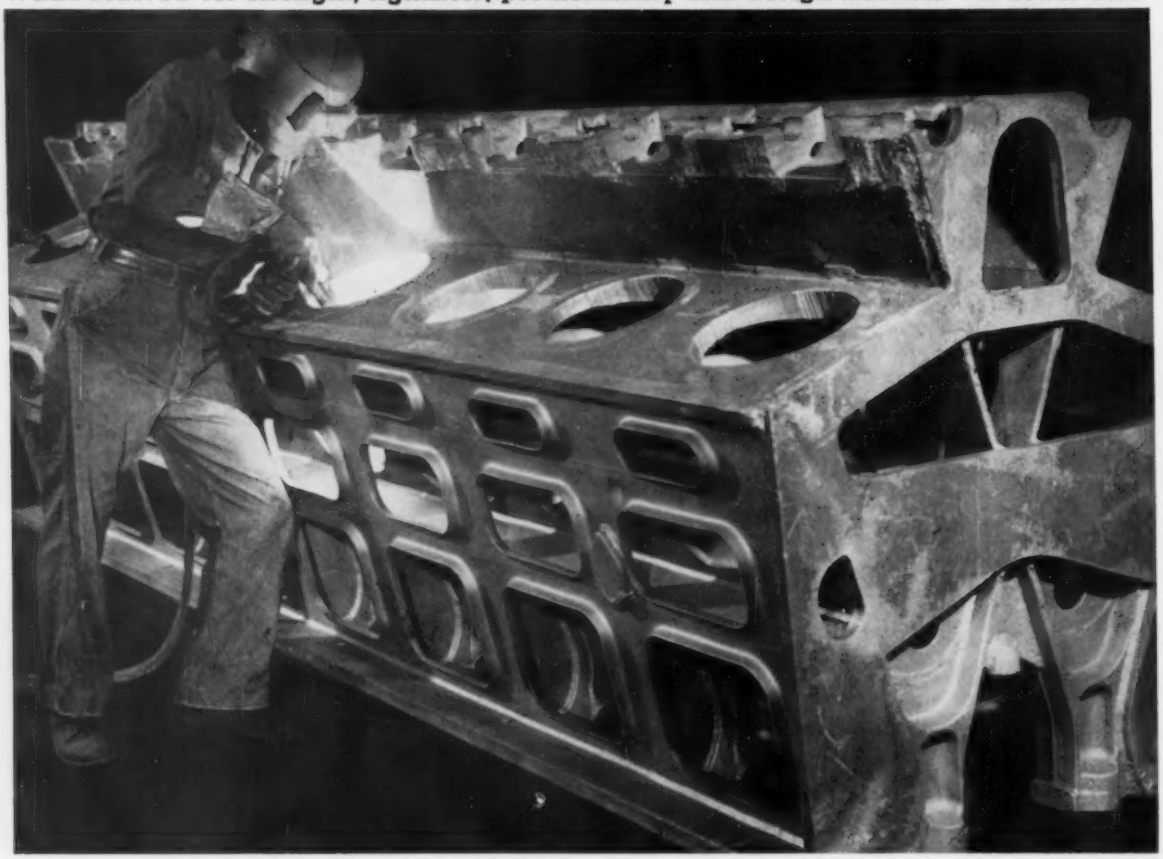
Position_____

Company_____

Address_____

City_____ Zone____ State_____

WELDMENTS for strength, lightness, predictability and design freedom—at lower cost!



DIESEL ENGINE FRAME: Weldments of this type have been responsible for weight savings as high as 32% with no sacrifice in strength and safety. Superior shock resistance protects engine performance. Maintenance costs are reduced and significant economies realized.

HERE'S THE STORY OF QUALITY BEHIND EVERY LUKENWELD WELDMENT

Lukenweld's extensive production facilities and experience add up to this: no matter how big, tough, or challenging the job, you get exactly what you want—on time—and at a cost that will fit your plans.

DEPENDABILITY The predictability and rigidity of welded structures plus Lukenweld's specialized knowledge of design and materials selection assures equipment that will perform efficiently, longer.

RELIABLE SOURCE OF MATERIALS Carbon, alloy and clad steel plates in the widest range of types and sizes available anywhere are obtainable "right next door"—from the Lukens rolling mills.

CONSULTATION SERVICE Metallurgical, design engineering, related services are available on your job.

FINISHING FACILITIES Modern heat treating, machining and other finishing facilities are your assurance of complete quality control from steel plate to finished weldment—ready for assembly in your equipment.

EXPERIENCE Lukenweld, the first commercial weldery in the U.S., pioneered many advances in welded construction. Knowledge and craftsmanship gained through this experience make Lukenweld unusually qualified to meet your weldment needs.

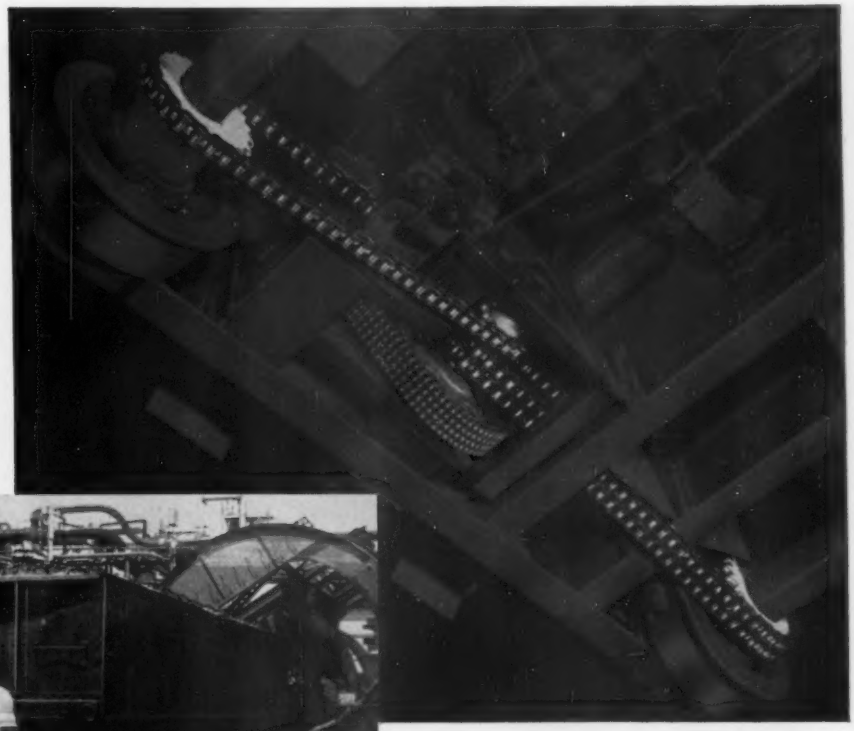
FOR INFORMATION on how Lukenweld can answer your particular weldment problems or for a copy of the informative booklet, "Weldments by Lukenweld," write on your company letterhead to Manager, Marketing Service, 819 Lukens Building, Coatesville, Pa.

LUKENWELD LUKENS

A DIVISION OF LUKENS STEEL COMPANY
COATESVILLE, PENNSYLVANIA

Pint-size Whiting Trackmobile gets switch-engine power with Morse Roller Chain Drives

Morse Chain drives take tremendous loads, punishing operating conditions right in stride



View of Whiting Trackmobile undercarriage, showing Morse Roller Chain Drives. Employs single-, double-, and quadruple-width chain. Photo at left shows Trackmobile pushing loaded coal car to dumper. Rubber-tired wheels at ends lower to permit operation of vehicle off railroad tracks.

The Trackmobile, manufactured by the Whiting Corporation (Harvey, Illinois), does the work of a large locomotive; easily handles loads averaging 100 tons.

A major reason for the Trackmobile's rugged performance is its powerful drive system, featuring Morse Roller Chain and Sprockets. Morse quality-engineered products function perfectly under abnormal loads, and conditions such as cinders, dust, snow, ice, sand, and extremes of heat and cold.

Morse Power Transmission Products offer the utmost in efficiency, flexibility, long life, and economy of operation.

Literature, engineering help free

Call your local Morse Distributor or write today for Morse Roller Chain Catalog C 51-50. Skilled Morse engineers are ready to help you solve virtually any problem concerning power transmission equipment—Roller Chain, Hy-Vo Drives, Silent Chain, Sprockets, Clutches, and Couplings.

MORSE CHAIN COMPANY • A BORG-WARNER INDUSTRY • ITHACA, N.Y.

MORSE MORSE B-W *trademark **POWER TRANSMISSION PRODUCTS**

TRAMRAIL CRANES

Indispensable for Efficient Production

Plenty of cranes in this Diesel motor plant ease the work and boost production.

Even though most parts could be moved by hand in this electrical factory, production is speeded and safety improved by employing inexpensive cranes with electric hoists

Three things which are held extremely important to modern industrial plants are achieved by the use of simple Cleveland Tramrail overhead cranes:

(1) Production is speeded
(2) Costs are cut
(3) Safety is improved

Cranes save many costly man-hours of skilled mechanics by enabling one man, in most cases, to pick up and move heavy or awkward parts that ordinarily require hard and dangerous work by several men when lifting and tugging by hand.

Even where light loads are lifted only a few times a week, it has come to be realized that the cost of Cleveland Tramrail cranes is well justified because they are a tremendous factor in the elimination of hernias, smashed hands and feet, wrenched backs and other unnecessary injuries.

Progressive plants regard overhead materials handling equipment as indispensable.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

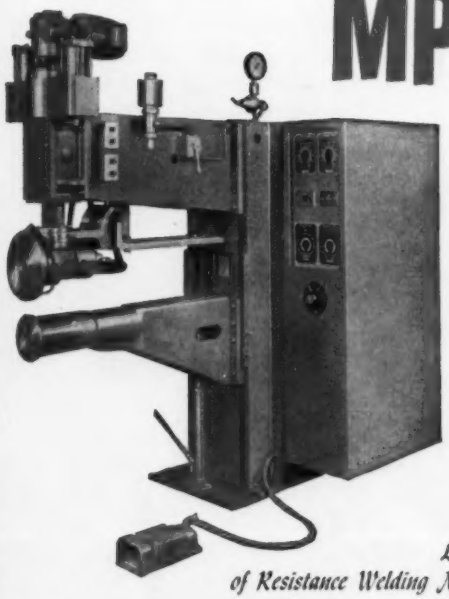
CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
4904 East 284th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

FOR THE FIRST TIME A COMPLETELY NEW DESIGN OF SMALL, LOW PRICE SCIAKY SEAM WELDERS

Featuring all the Ruggedness, Dependability and Consistency of Operation Common to Sciaky Basic Thinking—Welders Designed to Do More Useful Work at Lower Operating Cost with Maximum Reliability!

MP-2 AIR OPERATED, PRESS TYPE, LOW IMPEDANCE, SINGLE PHASE SEAM WELDER



Through advanced design, volume production tooling and complete use of integrated parts, Sciaky has been able to add a seam welder to its line of competitively priced, small, standard welders. Check these important design features . . .

Pneumatic Double-Acting Cylinder Head
Low Inertia, Anti-Friction Bearing Guided Ram
Side Mounted Sciaky Integral Control
Low Impedance Secondary Circuit
Sciaky High Efficiency Welding Transformer
Copper Alloy, Fully Adjustable Lower Arm
Silver Plated, Laminated Flexible Shunt Conductor
Simple, Positive Internal Gear Drive

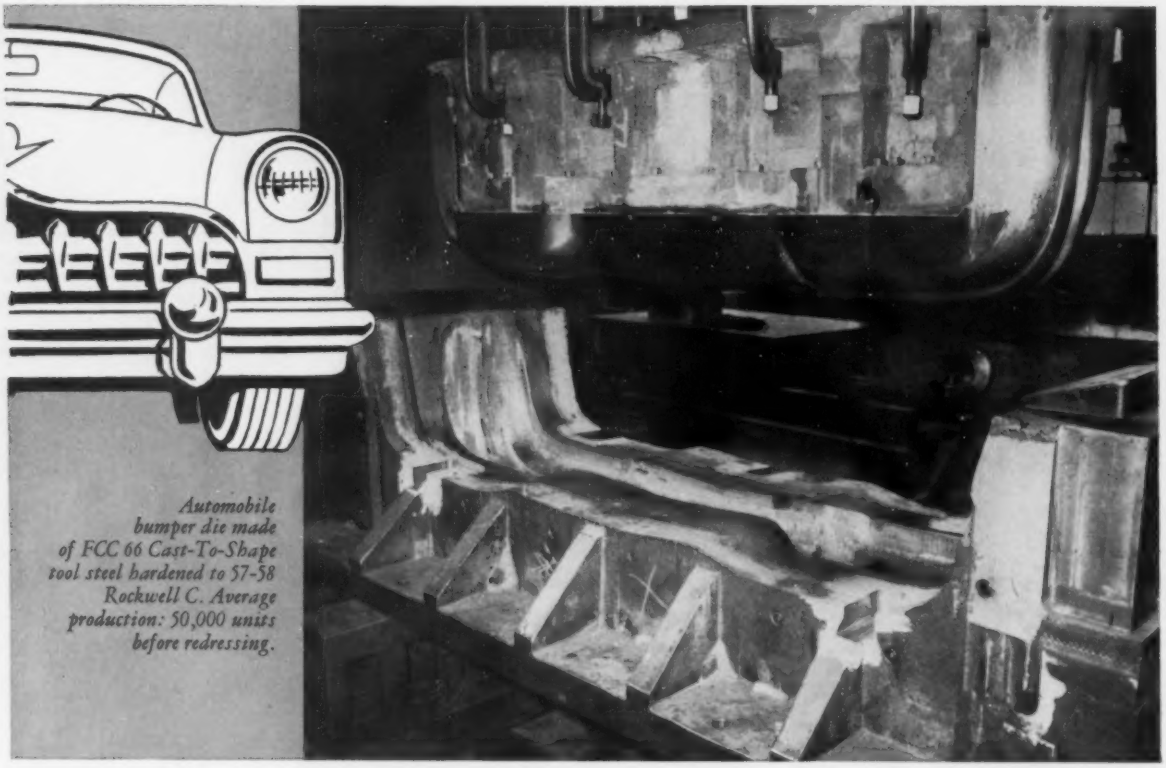
For complete details and specifications on the MP-2 seam welder write for Bulletin 321-7.

Largest Manufacturers of Resistance Welding Machines in the World

SCIAKY

SCIAKY BROS., INC. • 4923 W. 67th STREET • CHICAGO 38, ILLINOIS

Try this money-saving method that auto-makers use



Automobile bumper die made of FCC 66 Cast-To-Shape tool steel hardened to 57-58 Rockwell C. Average production: 50,000 units before redressing.

A-L CAST-TO-SHAPE TOOL STEELS

Auto makers, too, are included in the long list of manufacturers enjoying the advantages and economies of A-L Cast-To-Shape tool steels. By this modern, money-saving method of tool and die making, it is possible to cast even intricate shapes to within an eighth of an inch of finished size. The savings in time and material over that of machining from solid stock are readily apparent.

A-L Cast-To-Shape tool steels are offered in a variety of grades, and are electrically melted to precise laboratory standards. They are remarkably resistant to abrasion and possess great compressive strength. In many cases, they out-perform tools and dies made from solid bars and forgings.

Remember, with A-L Cast-To-Shape tool steels, you buy less steel originally, and you have less machining to do for finish. Ask your A-L representative about them TODAY . . . or write *Allegheny Ludlum Steel Corporation, Forging and Casting Division, Wanda and Jarvis Avenues, Detroit 20, Michigan.*

SEND FOR THIS NEW CATALOG

"FORGING AND CASTING PRODUCTS"

Contains the latest information on FCC Air Hardening, Oil Hardening and other Cast-To-Shape Tool Steel Specialties that can save you time and money . . . also Composite Die Sections and Smooth Hammered Forgings in a wide range of tool and stainless steels. *Don't wait—get your copy NOW.*

Write Today

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For complete MODERN Tooling, call

Allegheny Ludlum

AL® FINE TOOL STEELS SINCE 1854

Engineering never stops at WEAN...

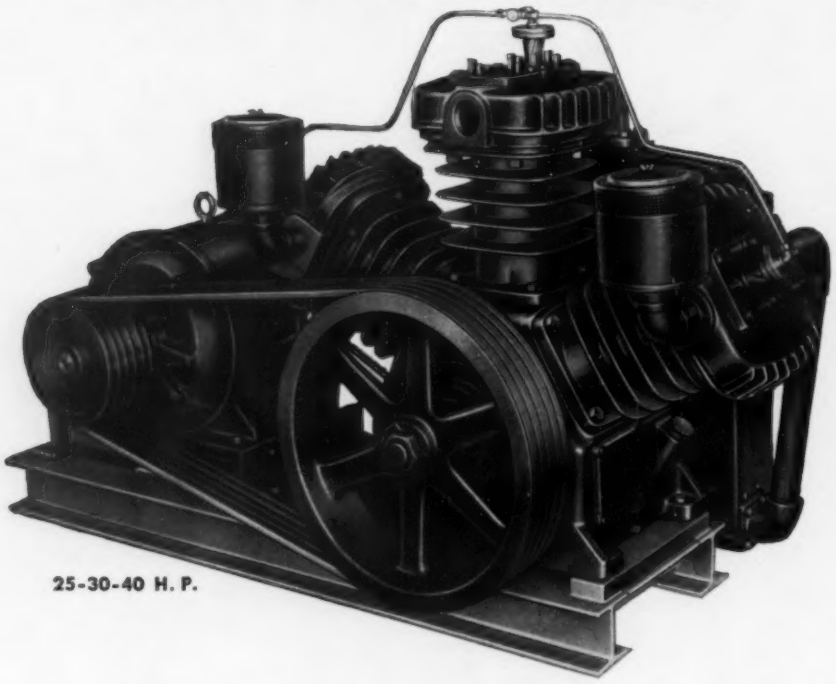
★ Wean has always been proud of their engineers' ability to anticipate the impending requirements of the steel industry and to design to satisfy these needs.

Today the challenge is greater than ever, and Wean engineers frequently "burn the midnight oil" to make certain their customers will always have the most advanced equipment when conditions require it.

THE WEAN ENGINEERING CO., Inc.
WARREN, OHIO

THE NEW CURTIS MODEL C-100
TWO-STAGE, AIR-COOLED AIR COMPRESSOR

Provides Higher Operating Efficiency
Costs Less to Install



25-30-40 H. P.

THIS NEW Curtis Two-Stage will deliver more air per minute, per horsepower and per kilowatt hour of electrical energy consumed, thus assuring a saving in your electrical bill.

It's Air Cooled, thereby eliminating expensive water bills and assuring quick and easy installation with no complicated plumbing problems.

The new C-100 embodies all the well-known Curtis engineering features such as centro-ring oiling and Timken Main Bearings.

For complete information write for illustrated folder.

Remember, you can count on . . . OUR 102nd YEAR

Curtis

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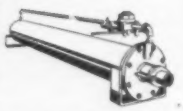
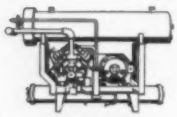
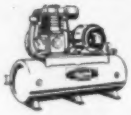


AIR HOISTS
AIR CYLINDERS



PACKAGED LIQUID CHILLERS



AUTOMOTIVE AIR COMPRESSORS

AUTO LIFTS

PACKAGED AND REMOTE AIR CONDITIONING

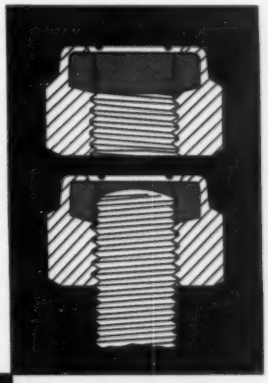
What's special about this STOP NUT?

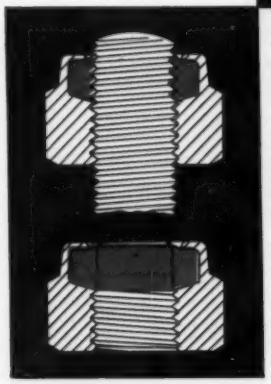
Several things make this nut unusual. For instance, you can "stop" it at any position on the threaded length of the bolt . . . or wrench it tight against the work where it protects bolt threads against corrosion and prevents liquid leakage. No matter where you leave it on the bolt, it will remain tight in that exact position, even though you subject it to heavy vibration and shock loads. But use a wrench on it and it comes off as easily as it went on. The red locking collar is nondestructive—does not gall bolt threads or remove plating. You can remove it and re-use it again and again.

What gives it its grip?

1 The locking collar is unthreaded and elastic. It has an inside diameter smaller than the major diameter of standard bolts.

2 The bolt impresses a mating thread into the collar and the resulting compressive forces exert a constant friction grip on the bolt. . . .





3 and exert a downward thrust bringing the lower flanks of the bolt thread into firm metal to metal contact with the matching nut threads, eliminating normal axial play.

4 Nut is removable and reusable . . . the Red Elastic Collar retains its grip after repeated usage.

Will it hold under ALL conditions?

The locking principle of the Elastic Stop® nut has been tested and proved by over 25 years of actual field service. Elastic Stop nuts are used on locomotives . . . and pile drivers. They fasten hedge shears and harvesters, drilling rigs and washing machines, trucks and roller skates. And no Elastic Stop nut customer has ever stopped using them because of unsatisfactory performance.

What about sizes and materials?

Elastic Stop nuts are available from a watchmaker's 0-80 all the way to 4"—in materials that include stainless steel, brass, aluminum and other alloys. Protect your product with "fastener insurance." Try Elastic Stop nuts on trouble spots, whether to protect expensive heavy equipment from costly downtime or to guarantee the accuracy of delicate electrical equipment by maintaining precision adjustments. We'll supply free test samples.

ESNA® TRADE MARK

ELASTIC STOP NUT CORPORATION OF AMERICA

Dept. N82-777, 2330 Vauxhall Road, Union, N. J.

Please send the following free fastening information:

☐ ELASTIC STOP nut bulletin

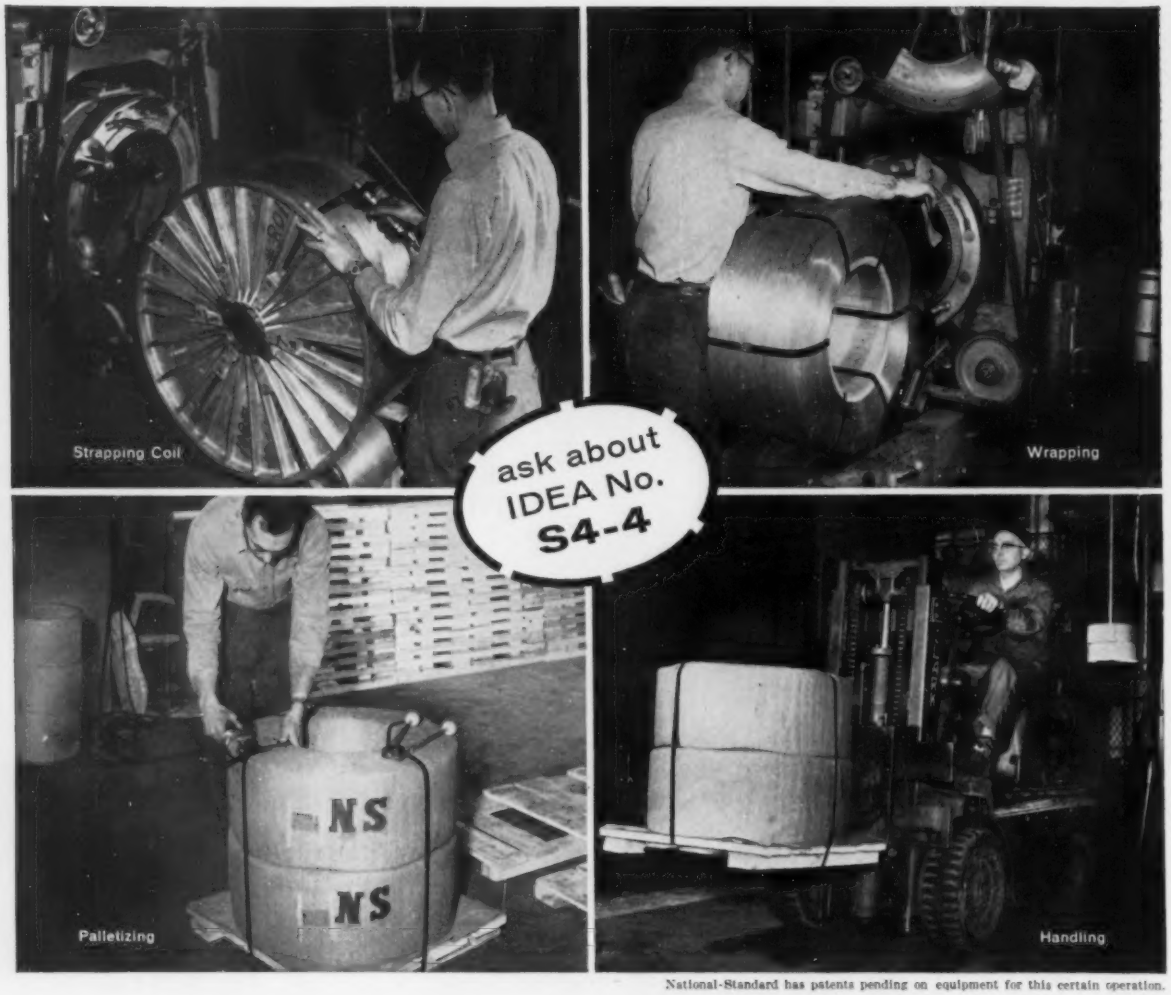
☐ Here is a drawing of our product. What self-locking fastener would you suggest?

Name_____ Title_____

Firm_____

Street_____

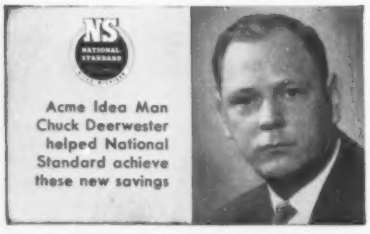
City_____ Zone_____ State_____



National-Standard has patents pending on equipment for this certain operation.

Check your AIM* . . . National-Standard did

Steel strapping idea cuts two big costs



NATIONAL-STANDARD COMPANY of Niles, Michigan, with an important assist from Acme Steel, has cut *shipping* and *handling* costs for its customers in the packaging of tire bead wire.

This wire formerly was shipped on returnable steel reels, for which the customer was charged—then credited when reel was returned. Wire is now wound on a fibre core placed on a collapsible reel. Acme Steel Strapping is applied, reel is dismantled, and coil of wire is ready for wrapping and palletizing. Reel charges are abolished, freight costs to customers are cut, and palletizing with steel strapping is simplifying handling and storage problems.

***Check YOUR Acme Idea Man.** He will work with you—give you Acme Steel Strapping ideas to help you with your packaging and shipping problems. Call him at the nearest Acme Steel offices, or write Acme Steel Company, 2840 Archer Avenue, Dept. EFS-76, Chicago 8, Illinois.

ACME STEEL STRAPPING ACME STEEL

VITAL NEWS ON METAL-ARC GAS SHIELDED WELDING

If You Pay More Than 1½¢ Per ft. for Shielding Gas . . . You're Paying too Much!

A new all-CO_2 gas process by Liquid Carbonic saves approximately 7¢ on every foot of shielding gas used. Expensive argon or helium are entirely replaced by low-cost CO_2 in metal-arc gas shielded welding of carbon steels.

High quality, high speed welds

The new Liquid Carbonic all-CO_2 MAGS process (metal-arc gas shielded welding) produces welds which are equal or superior in both speed and quality to welds made with argon or helium shielding.

Adaptable to both hand and automatic equipment

Your present equipment can probably be used, either "as is" or with modifications. There is no extensive "change over" period with the new Liquid Carbonic all-CO_2 MAGS welding process.

Low cost multiplies the possibilities

By greatly reducing shielding gas costs, Liquid Carbonic's all-CO_2 MAGS process makes the many advantages of shielded gas welding available for even "low budget" applications.

A special welding grade CO_2 gas

CO_2 specifically manufactured for gas shielded welding has been developed by Liquid Carbonic. This gas is of the highest purity and packaged in specially marked 50 lb. (435 cu. ft.) cylinders. New Red Diamond Welding Grade CO_2 assures the highest possible metal-arc gas shielded welding performance.

World's Largest Producer of

THE LIQUID CARBONIC CORPORATION

3164 South Kedzie Avenue
Chicago 23, Illinois

Welding a pulley with Liquid Carbonic's new all-CO_2 MAGS process. In addition to cutting welding costs, new process virtually eliminates warpage because of reduced heat input.

Complete technical and operating data available

For your free copy of Liquid Carbonic's fact-filled new booklet on all-CO_2 metal-arc gas shielded welding, simply

MAIL THIS COUPON

THE LIQUID CARBONIC CORPORATION
3164 South Kedzie Avenue • Chicago 23, Illinois

Please send me complete technical and operating data on Liquid Carbonic's new all-CO_2 process of metal-arc shielded welding.

Name_____

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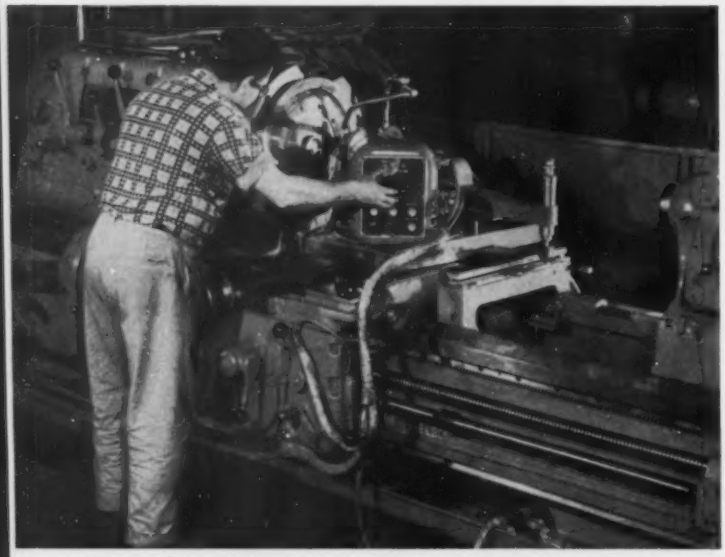
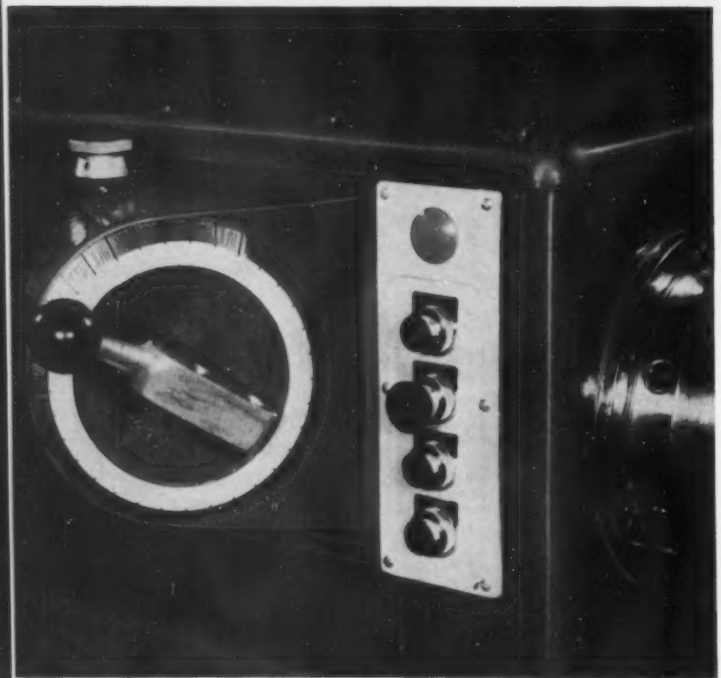
City_____ Zone____ State_____

AXELSON production and maintenance news

AXELSON MANUFACTURING COMPANY / DIVISION OF U.S. INDUSTRIES, INC. / 6160 SOUTH BOYLE AVENUE, LOS ANGELES 58, CALIFORNIA



TURBO-JET ENGINE PRODUCTION. Contouring aft side of 125-pound turbine wheel on Axelson lathe equipped with electronic duplicator.



CENTRALIZED HYDRAULIC PRESELECTOR is one of the keys to easier operation and unusual flexibility of the Axelson 2516 heavy-duty lathe. With the preselector, the lathe can be used with equal ease for long-run production or single set-up operations.

ELECTRONIC TRACER CONTROL FEATURED IN JET TURBINE PRODUCTION

Rotating engine parts, which operate under widely fluctuating environmental conditions during high-speed aircraft flight, must be precisely machined so expansion and contraction of the metal will not affect engine performance.

At General Electric's AGT Division, Evendale, Ohio, Axelson lathes equipped with electronic duplicators reproduce turbo-jet engine parts. Using simple, flat templates, the electronic duplicators precisely control the lathes for highly-accurate contour-facing operations. Special carbide-tipped tools are used in the two-stage turning operations on the 28-32 Rockwell, Timken steel turbine rotor wheels. Floor-to-floor time for these two operations is less than an average work day.

NEW 2516 HEAVY-DUTY LATHE SIMPLIFIES OPERATOR CONTROL

Speed selection of 32 different spindle speeds from 11 to 1600 RPM has been greatly simplified in the new Axelson 2516 heavy-duty lathe through the use of a hydraulic preselector.

The operator can preset a new spindle speed while the lathe is in operation, move to the end of the bed and, without returning to the headstock, automatically switch to the preselected speed by operating a lever on the apron.

Speed changes are made through involute clutches; the headstock contains no sliding gears.

For a complete description and detailed specifications on the 2516, the new Axelson 4025 and Axelson Tool Room, Medium-Duty and other Heavy-Duty Lathes, write for bulletins I7-5507 and 5504.

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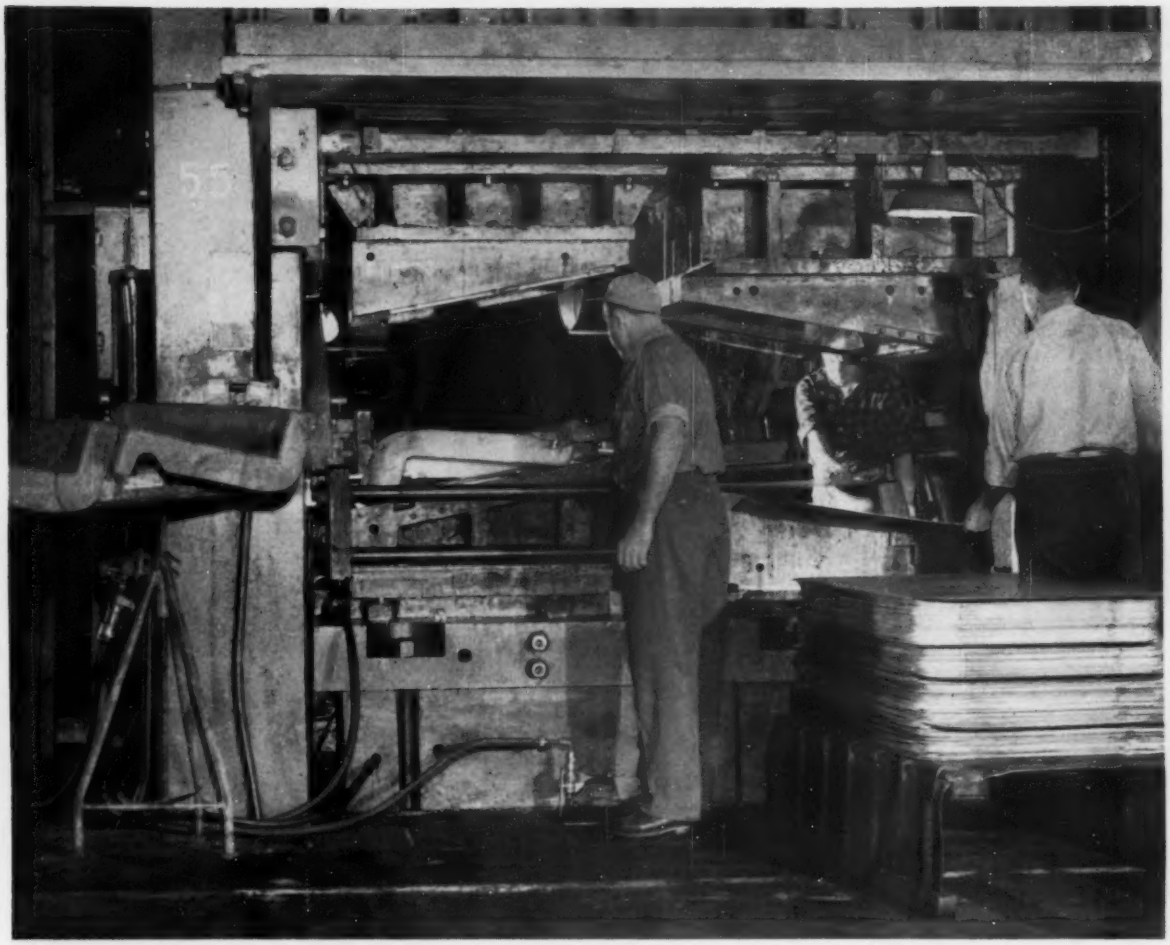

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Yes, Youngstown Sheets and Strip have exactly the right combination of tensile strength, ductility and surface finish to form perfectly in your presses.

And just as important, they have the uniformity of quality that enables you to run even the most difficult part hour after hour without jam-ups and with a minimum of rejects.

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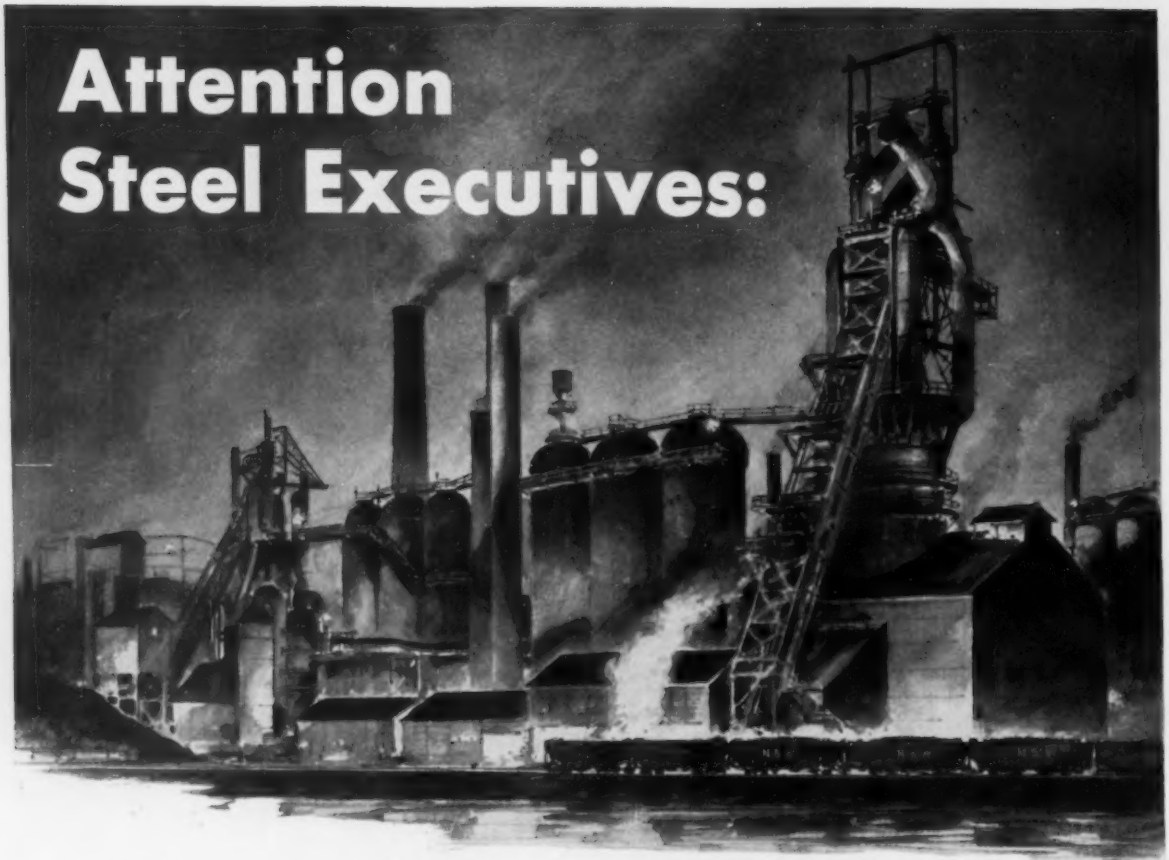
Attention Steel Executives:



for Ore, Coal, Limestone, Water . . .

along the Norfolk and Western is the plant site for you!

You can build a steel mill along the N&W and be "next door" to coal and limestone. You can build directly alongside the water you need. You can avail yourself of short-haul advantages in transporting ore from the big, modern Port of Norfolk.

The coal is the world's finest Bituminous, and the supply is virtually unlimited.

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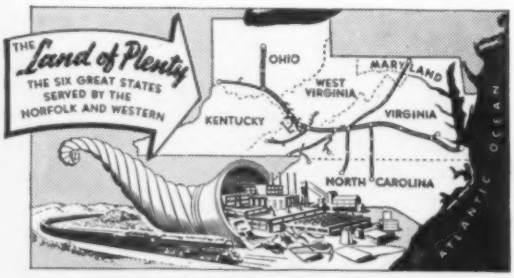
The water is adequate for the needs of a steel mill of any logically conceivable size.

We have *eye-opening* data on exceptional location advantages for steel mills. WE *INVITE YOU TO CONFIRM OUR FINDINGS.* Our plant location specialists will work with you in confidence and without obligation.

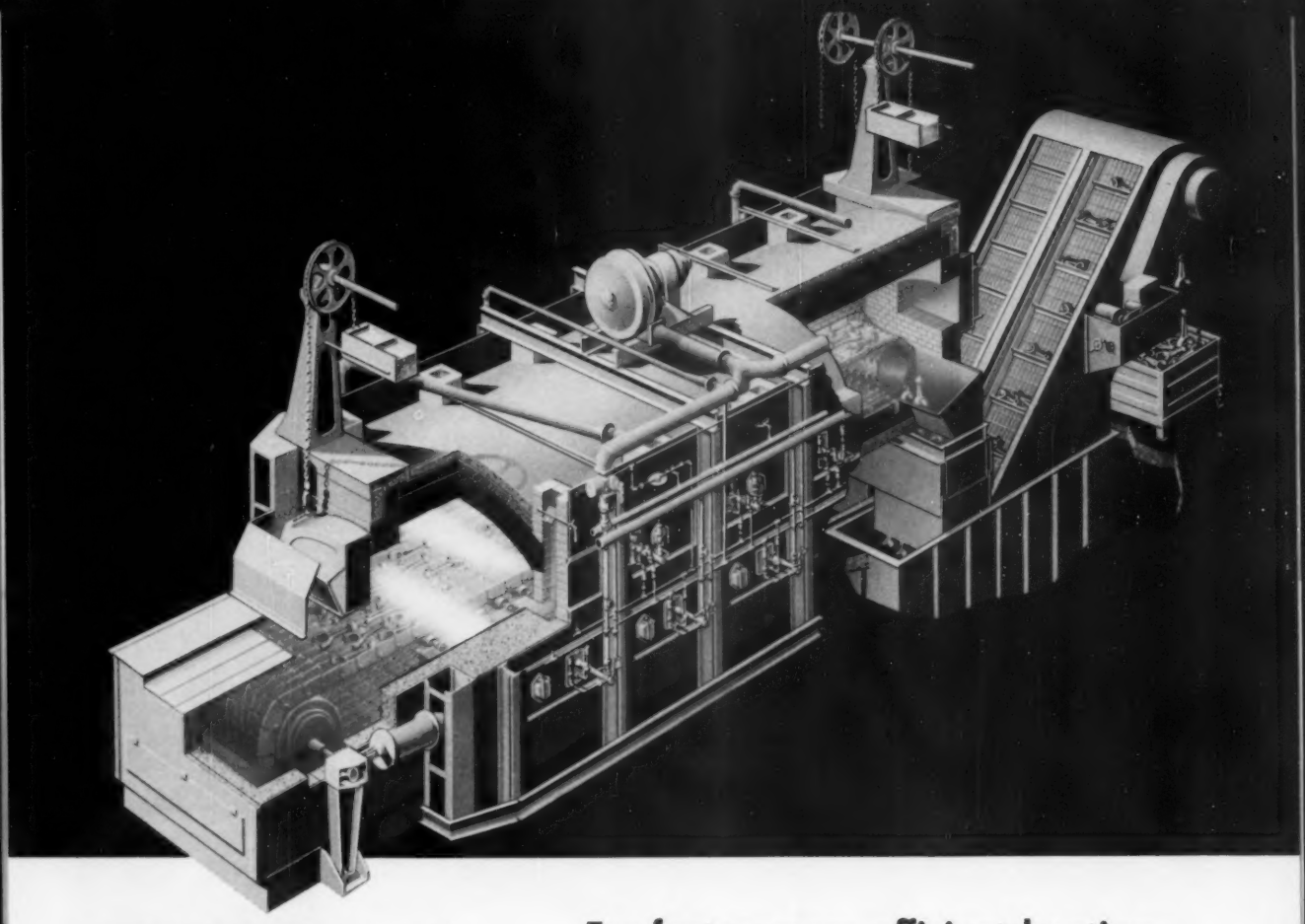
The advantages outlined are exceptional. Investigate them.

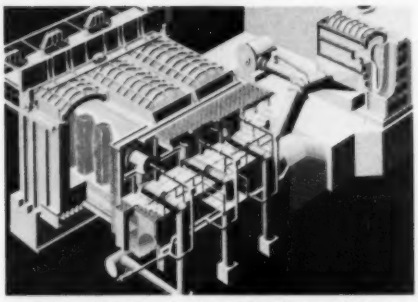


Write, Wire or Call:

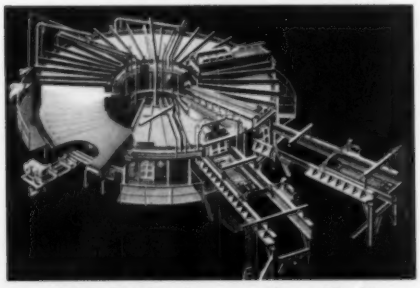
L. E. WARD, JR., Manager
INDUSTRIAL AND AGRICULTURAL DEPT.
Drawer 1A-724 (Telephone 4-1451, Ext. 474)
Norfolk and Western Railway
ROANOKE, VIRGINIA

Norfolk and Western RAILWAY





Fast heating, high production soaking pits are a specialty of Salem-Brosius.



Salem-Brosius has earned world-wide recognition for rotary hearth furnaces.

For faster, more efficient heating or heat-treating furnaces, it pays to call on Salem-Brosius

Throughout the entire metals industry, Salem-Brosius designed furnaces are doing an efficient, low-cost job of heating and heat treating. The hardening furnace shown above in cut-away scale drawing is typical of high production heat treating furnaces by Salem-Brosius.

Gears, connecting rods, crankshafts and other critical forged parts are hardened in this type of furnace. Parts are heated to hardening temperature, soaked at this temperature for a controlled length of time and quenched—all automatically. Parts are also discharged automatically from the quench. This gas-fired, chain-belt, conveyor-type furnace is designed for high production, low maintenance and efficient operation—typical of all Salem-Brosius furnaces. Flexibility of time-temperature control reduces labor cost, assures product uniformity and permits variations of the heat-soak cycles.

For any heat treating job—hardening, annealing, normalizing, aging, solution heat treating, and other forms—consult Salem-Brosius for the best in furnace equipment.

SALEM-BROSIUS, INC.

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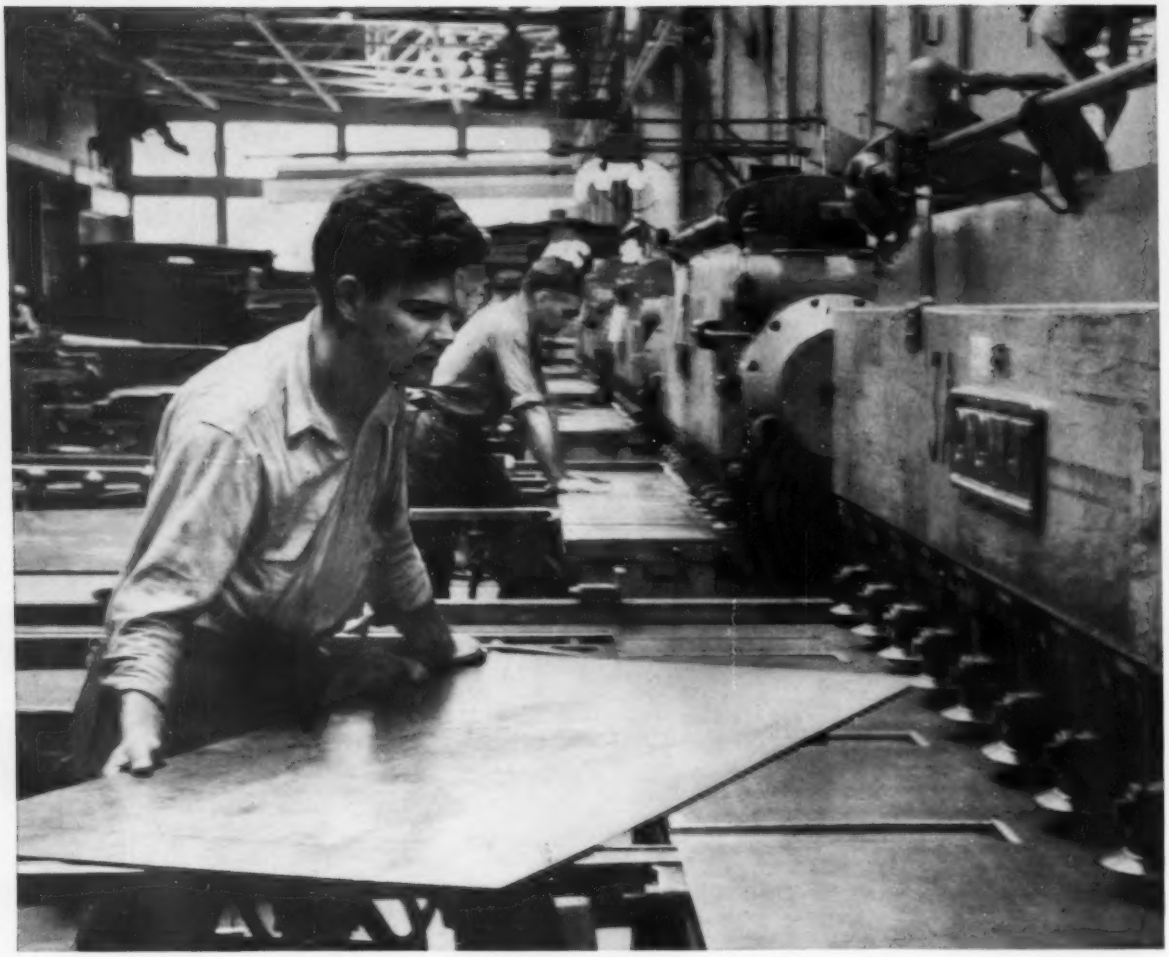

3 kinds of help on sheet and strip steel

Sheet and strip buyers tell us that three kinds of purchasing help keep them coming back to Ryerson:

1. WIDER SELECTION OF TYPES—More than 20 kinds of sheet and coil stock are on hand in an unusually wide range of gauges—making it easier to get the exact steel needed for any requirement.

2. GREATER PROCESSING CAPACITY—The most extensive cutting and processing facilities in the steel-service industry enable buyers to get quickest service on requirements for special sizes, strip and sketch cutting, blanks, slit coils, edging, or any other processing.

3. HELP ON SHEET AND STRIP PROBLEMS—The large Ryerson staff of sheet and strip specialists gives buyers a valuable source of help in selecting the most satisfactory and economical stock—or in solving any other problem of application and fabrication.

In addition, sheet and strip buyers like the good packaging, the dependable weight and on-schedule delivery that they get from Ryerson—and the convenience of one-order buying of all steel products from the same source. So call your nearby Ryerson plant for 3-way help on sheet and strip needs.

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PRINCIPAL PRODUCTS: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing, industrial plastics, machinery & tools, etc.

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NEWSFRONT

Structural Gray Market: Doubtful

Pittsburgh-area contractors doubt that there's much structural or plate steel in the hands of gray marketers. There are reports of structurals being offered at double normal warehouse price, and several contractors have been getting feelers on premium deals for over a year. But prolonged pinch on structurals, plate has worked against any speculator buildups.

Government's Still Stockpiling

Federal agencies continue buying minerals, metals, both to fill stockpile requirements and to help shore up domestic production. Latest programs working their way through Congress call for purchase of 30,000 tons of manganese ores or concentrates, 10,000 tons of tin concentrates. Tin would be delivered to West Coast points. Already approved: continued purchases of tungsten, asbestos, fluorspar, columbium-tantalum.

For Dripless Paint-Dips

Thixotropic paint gels when left undisturbed. Property attracts metal finishers' interest. Kept liquid in paint dip tanks by mechanical agitation, paint tends to set almost immediately as parts lift out. Result is greatly reduced dripping, sagging, curtaining and tearing of the paint film. Recent shop experience with high-production setups appears favorable.

Tighter Gear Specs Coming?

Auto producers adoption of the gas turbine would lay new problem in engineers laps—that of super-accurate gears. Automotive gas turbines spin at 30,000 to 40,000 rpm. These rates would either mean use of a high speed rear axle or a high ratio gear box and transmission.

Antitrust Suit Overtones

Current GM/Government go-around has interesting implications for railroaders. Corp.'s beleaguered Truck & Coach Div. also turns out Aerotrain coaches, actually bus-body railroad coaches, in conjunction with Electromotive Div. Suit successfully cutting back bus operations could conceivably reduce competitive price advantage on Aerotrains as well.

Better High-Heat Alloy

A relatively new vacuum-melted nickel-base alloy, M-252, is being used for turbine buckets in four G-E gas turbine engines. It's suitable for extended operation at 1240 F. Other advantages: high rupture strength, good fatigue strength, high resistance to thermal shock at speeds of 6900 rpm.

No Immediate Farm Pickup Seen

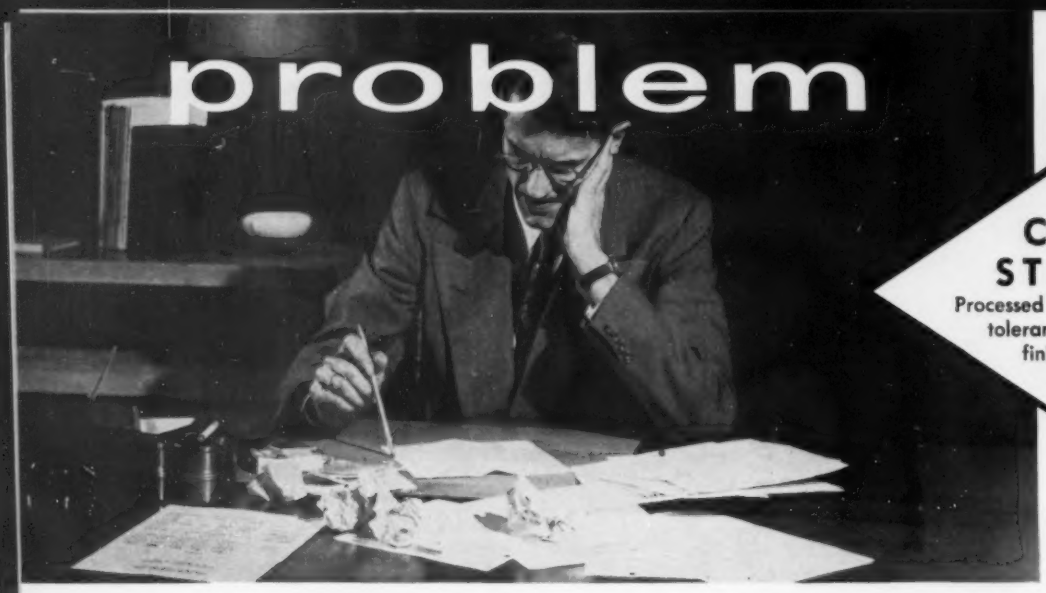
Despite a freshening trend in Canada, improved crop and government aid possibilities here, old hands in the farm equipment industry aren't optimistic about second-half sales. Equipment producer buying departments remain wary. They aren't ready yet to admit possibility of any sales upturn similar to that experienced by Canadian manufacturers a month ago.

Tight Pipe Situation Likely

Sharp cutbacks in availability of heavy concrete pipe for sewer and culvert use seem likely soon, though producers have heavy stocks on hand now. Reasons are two. One, rod and mesh for reinforcing the pipe are already desperately tight. Two, big inventories now in producers hands are largely material already contracted for. New buyer orders will have to wait manufacture of more material.

Structural Parts Shock Tester

A double-acting, rapid-impact-loading bomb has been developed by Cornell engineers as a test instrument. It gives structural parts a simulated atomic explosion treatment, exerting an impact that climbs from zero to 30,000 psi in 1/200 second. This is held for 1/10 second, removed in 1/200th second. Purpose is to find out how full-scale structures react to short-period, high-intensity loading, as an aid in designing shock-resistant structures.



CMP
RESTRICTED SPECIFICATION
COLD ROLLED STRIP STEEL
Processed to meet special gauge tolerances and provide special finishes and physical properties . . . solves many fabrication, cost & performance problems.

Helping to overcome metal fabricating difficulties, improving products without skyrocketing costs or just getting costs down are usual events with **CMP.**

For example, the manufacturer who was heat-treating formed steel parts subsequently assembled with other components into a powered unit. The forming involves severe deformation and was hampered by lack of uniformity in the annealed strip steel. Distortion in the heat treatment followed, resulting in a low percentage of finished assemblies passed as satisfactory.

To minimize these fabricating difficulties, **CMP** developed a special annealing process for the strip. Using this steel, parts, when subjected to the manufacturer's standard heat-treating practice, were acceptable and yield was greatly increased.

At **CMP,** processing cold rolled strip steel to restricted specifications has been reduced to an exact science and **CMP** men have been trained to spot opportunities for solution of production cost and product improvement problems through application of restricted specifications.

Why not put your problems up to a **CMP** man?

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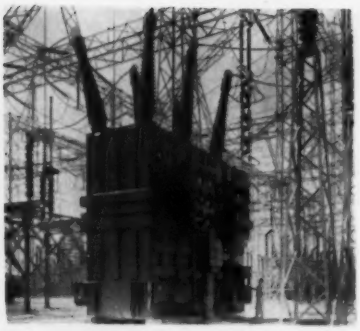
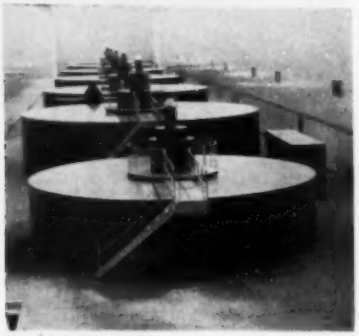
CMP
RESTRICTED SPECIFICATION
COLD ROLLED STRIP STEEL
is available in
Low Carbon Grades • High Carbon Spring Steel (annealed and tempered) • Stainless Types • Alloy Grades • Electro Zinc Coated





TYPICAL scenes in electric power's expansion plans (top to bottom): World's largest autotransformer installed by Westinghouse at Tanners Creek Plant; hydro-electric generators, also installed by Westinghouse, at John H. Kerr dam in Virginia; erecting 330,000-v transmission lines by American Gas and Electric; Tanners Creek plant of AGE, now in operation.

Electric Power's $75 Billion Plans

Metalworking will get a big share of nation's need for more electric power . . . Nuclear power is big factor in industry's plans to quadraple output in 20 years—By *R. D. Raddant.*

◆ TO DOUBLE CAPACITY in 10 years, quadruple in 20—that's the goal and requirement of the expanding electric power industry.

The industry has spent $21 billion for expansion since 1949, is currently spending at a rate of $3 billion a year. Within 19 years, expenditures will average $4 billion a year, reaching an annual level of $6 billion a year by 1966.

Harllee Branch, Jr., president of the Georgia Power Co., who recently completed a term as president of the Edison Electric Institute, predicts that the electric power industry will spend $75 billion in the next 20 years.

Metalworking's share will include vast tonnages of structural steel, reinforcing rods, special alloys for turbines and pipes, new alloys for nuclear installations, thousands of miles of transmission and distribution cable, and finished products such as transformers, circuit breakers, and the giant turbines required for steam and hydro-electric generating installations.

Big Figures

Philip Sporn, president of the American Gas and Electric Co., possibly the nation's largest electric utility, predicts that the average electricity consumption for each residence will soar from 2750 kwh in 1955 to 10,000 kwh in 1975, that average kwh per man hour in U. S. industry will rise from about 9 today to 19 in 1975, bringing the nation's total industrial use to around 900 billion kwh in 1975 compared with 320 kwh today.

Following these figures through, capacity of the electric industry will climb from today's 116 million kw to over 400 million kw in the next 20 years.

And in that time, something new will be added to the power industry. A total of 15 nuclear power projects have been proposed as a source of heat for commercial production of electric power at a cost of over $300 million. It's estimated they will generate 1 million kw. A recent survey by the Electric Power Committee of the Edison Institute estimates that it is "reasonably certain" that nine of the projects will be constructed.

Spending Plans

Just how will that astronomical total of $75 billion be spent? Here are a few examples of announced expansion, covering five years:

American Gas and Electric Co., serving broad areas of Ohio, Indiana and the Ohio River valley, is in the early stages of a $700 million, 5-year expansion program.

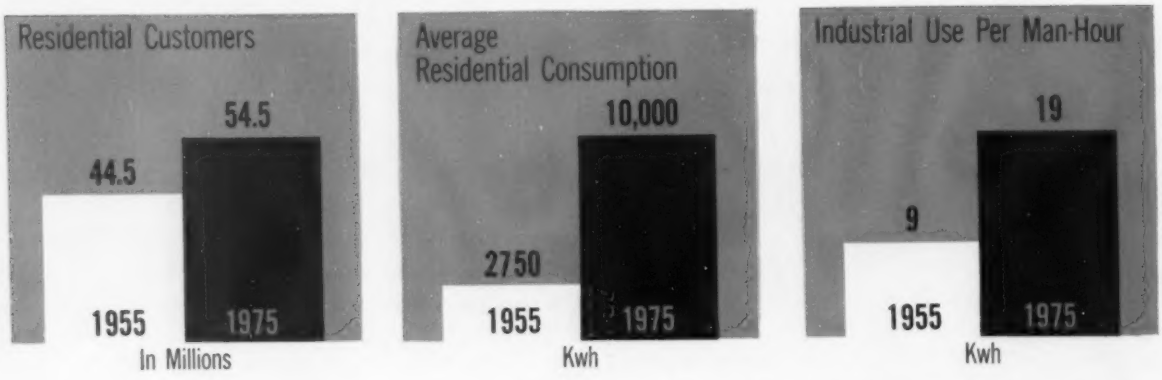
On the West Coast, Pacific Gas & Electric Co. has embarked on an expansion program of similar magnitude.

In metropolitan New York, Consolidated Edison will spend $650 million from 1956 to 1960 in expanding its generating, transmission and distribution systems. These three utilities contend for leadership in the nation, with each claiming leadership for either capacity, output, or revenues.

Across the nation, similar expansions are planned by utilities serving other areas.

American Gas and Electric

Why Power Needs to Expand



▶ **Capacity Required:** 1955—**117,** 1975—**325-425** million kw

breaks down its $700 million, 5-year program as follows:

Three hundred nineteen million dollars for generation (power plants), $185 million for transmission (high voltage), $153 million for distribution (low voltage), and $43 million for all other expenditures, including coal lands, office and service buildings, rolling stock and other capital equipment.

Consolidated Edison's expenditures would vary considerably in pattern from AGE's. Con Edison's distribution is entirely metropolitan, which means that transmission is all underground, resulting in heavy distribution costs under New York's streets and through Manhattan's solid rock base.

On the other hand, AGE's vast network of generating, transmitting and distributing facilities serves only three cities over 100,000 in population, but with a network of 72,000 miles of lines.

Distribution Costs

It costs Con Edison $200 to install a kw of capacity, $300 for its distribution. But this year, to illustrate how the pattern varies, Con Edison will spend $120 million in its construction program, but $86 million will go to distribution facilities (housings for transformers, cables, switch gears, transformers, etc.).

This higher than average expenditure for distribution results from a need to increase distribution capacity under New York's streets, a highly costly operation brought about by the city's increasing demand for electricity.

AGE and Con Edison each have disclosed plans for three giant generating stations. What this involves in materials and manufactured products is illustrated in these figures for AGE's Clinch River plant, to be constructed by AGE's subsidiary Appalachian Electric Power Co. in southwest Virginia.

The power station will have an initial generating capacity of 450,000 kw, will cost an estimated $55 million. It will occupy a 105-acre site, and power will be generated by two 225,000-kw generating units.

The plant will employ two outdoor Babcock & Wilcox boilers, each equal in height to a 10-story building. They will provide steam at a pressure of 2000 psi at a temperature of 1050°F to the plant's two General Electric cross-compound turbine-generators.

The two Clinch River units are the sixth and seventh in a series of 225,000-kw units being built on the AGE system. They will boost the system's capacity to 5,700,000 kw by 1958, an increase of 325 pct since the end of World War II.

Along with the power program, the plant will erect three 132,000-v double circuit transmission lines. The three lines will total 108 tower miles or 216 circuit miles.

Materials involved in electric power's expansion vary from reinforcing bars to turbine blades, which require special alloys to withstand the high speeds and temperatures. Turbine blade tips, revolving at 3600 rpm, must travel faster than the speed of sound at temperatures that may go as high as 1500°F.

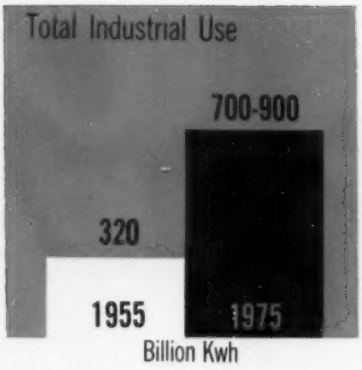
New alloys are also being developed for the steam piping, which is becoming more and more complex, and with special requirements, as steam temperatures and speed increase.

Equipment Delayed

Edison Electric Institute's power survey says that manufacturers of heavy power equipment report a general tightening in materials, with lengthening delivery schedules, particularly in plate.

"This situation is not considered critical," the survey states, "but warrants close attention. Nickel-bearing alloys continue to be troublesome items."

This conclusion was made before the steel strike paralyzed most of the nation's steelmaking capacity. A strike of any length will have a serious effect on power's plans this year. The prolonged strike at Westinghouse also contributed to a lengthening of lead time for heavy electrical equipment.



Estimates based on industry surveys

Because of the size and complexity of generating equipment, electric companies place orders for their power equipment far in advance.

U. S. electric power systems have on order and scheduled for shipment 6,582,300 kw of capacity of large steam turbine-generators for 1956, 11,353,600 kw for 1957, and 8,097,000 kw already placed for 1958. Almost 1 million kw is also on schedule for 1959 and later.

In generators for hydraulic turbines, the industry has ordered 1,107,400 kw of capacity for shipment in 1956, 1,690,600 kw for 1957, and 1,122,900 scheduled for 1958.

Only One-Eighth Hydro

The role of hydro-electric power in the over-all power situation is a diminishing one, with the role of steam generation taking on a greater importance. Long term emphasis is on nuclear power.

In 1955, the hydro-electric generating capacity of the U. S. was just short of 21 pct of the total generating capacity. This represents a decline from about 28 pct in 1945.

Mr. Sporn's projections indicate that in 1975, despite some expansion of hydro-electric power, only one-eighth of the power will be generated by hydro-electric sources.

It is in the development of nuclear energy as a source of heat for commercial power that the greatest change will take place.

Con Edison, which was the first to enter the nuclear field on a privately financed basis, will be generating electricity by 1960 from atomic energy. Its Indian Point, New York, nuclear steam generating station will cost $55 million and will generate 236,000 kw. This installation will use thorium to superheat steam.

It is expected that the Indian Point installation will produce electricity at a cost of 9 mills per kw, compared with 11 mills in the Con Edison system and the best established rate of about 7.5 mills.

Nuclear Power Plans

By the end of this year, Con Edison will have contracted to spend $25 million of the $55 million cost.

Other large nuclear power installations planned include:

Commonwealth Edison Co. and a Nuclear Power Group made up of eight other companies, privately financed $45 million installation at Dresden, Ill. This will be in operation by 1960.

Pennsylvania Power & Light Co. expects to have its 150,000 kw installation in operation by 1960.

Yankee Atomic Energy Co., composed of 12 New England power companies, will have its 134,000 kw plant in operation at Rowe, Mass., by 1960. This is under the Atomic Energy Commission Power Demonstration program. Cost is $33 million.

Duquesne Light Co. expects to have its installation at Shippingport, Pa., generating power as early as 1958. This 100,000 kw plant will cost $37.7 million under a 5-year AEC Reactor Development Program.

The Detroit Edison Co. and 23 other power companies will invest $45 million in a privately financed plant in the Detroit area.

Consumers Public Power District, at Columbus, Neb., will build a $24.3 million plant under an AEC Power Demonstration Program.

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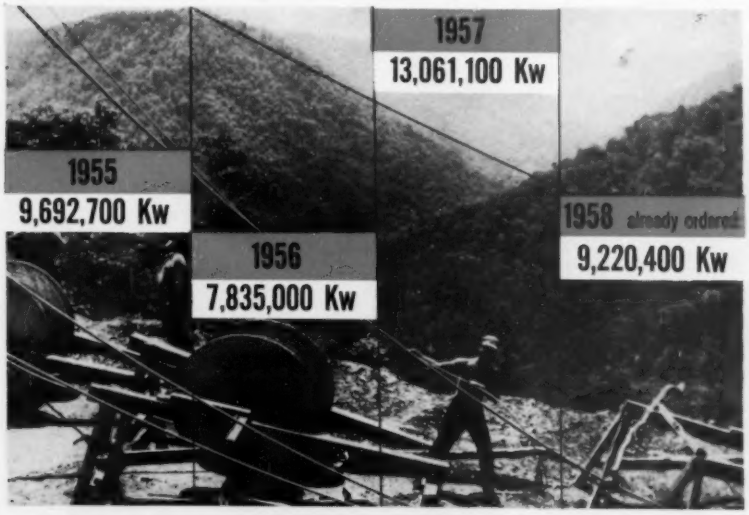
How Power Industry Plans Ahead

U. S. Electric Generating Capacity (kw) Shipped or on Order



Total Scheduled 30,164,500 kw

Total Includes:		
	Large Steam Turbine Generators	25.9 million
	Small Steam Turbine Generators	.13 million
	Generators for Hydraulic Turbines	4.04 million

STRIKE: Lowers Boom On Construction

Steel walkout aggravates structural and plate bottleneck . . . Steel's own expansion program threatened . . . Fabricators cut back operations and ponder gloomy outlook . . . Inventories low—*By K. W. Bennett.*

◆ "THE STEEL strike was the last straw. I've had it."

Comments like this mirror the frustration of jittery construction firm heads and field superintendents directly involved in one of the nation's dizziest construction booms.

And there's good reason for it. Even before the strike, important public and private construction projects had been running into delays because of structural and plate bottlenecks. Steel's own expansion program is not exempt. Apart from picket-shutdowns of mill construction programs, steel producers have been competing with their own customers for a share of available shapes.

An IRON AGE check of major structural fabricators reveals that some were cutting back operations less than two weeks after the strike got underway. Reductions in hours worked of as much as 22 pct were reported. This means that contracts written in May already are going delinquent.

Backlogs Heavy

Because most fabricators work as much as 60 days ahead of their mill supply, many will be operating at reduced pace up to the first week in September. After that, operations will depend on how individual companies ferret out needed material, assuming the strike ends meanwhile.

The strike came at a time when fabricators were sitting on a 12-15 month backlog, with at least another $100 billion of new construction in the talking stage, and as the $52 billion highway program finally got the green light. Initial impact of the highway program will be felt by fabricators in October, though really heavy orders will be placed next spring.

As a rough rule of thumb, fabricators were running 30-60 days behind delivery committments as the strike began. Generally speaking, cement is short, wire mesh is short, and steel structural shapes are critical.

The structural problem was compounded earlier when many mills dropped one month's tonnage from their rolling schedules in May. Which means that most fabricators lost 30 days of steel deliveries which had already been sold as fabricated steel shipments.

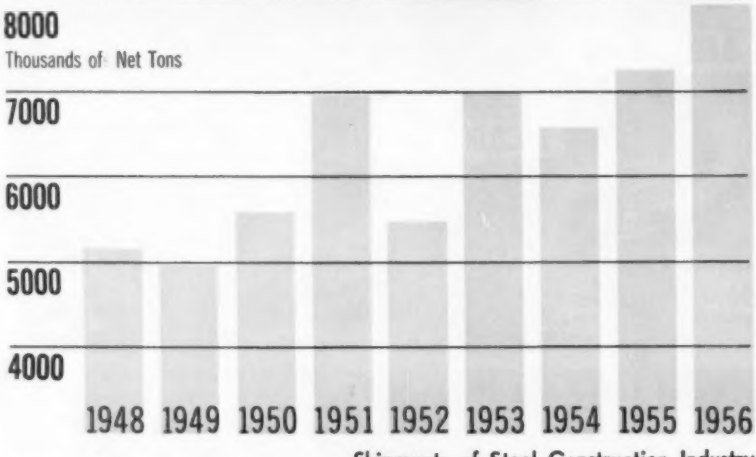
Mills Behind Schedule

On top of this, the mills were already carrying over 4-6 weeks tonnage as carryover, material that could not be delivered from the mill on the date originally specified. This steel, too, had been contracted for by the customers of the fabricators.

Most fabricators have conservatively 12-15 months backlog of unfilled orders. At the same time, bookings of new orders for fabricated material have been outrunning shipments since January, 1955. In the first five months of 1955 fabricator bookings ran an average of 40,600 tons per month ahead of actual deliveries. It was not a matter of critical importance then, because backlogs were low.

But in second-half 1955, backlogs began to stretch. An average of 45,800 tons per month was booked over the level of monthly shipments. And in the first five months of 1956, the order-shipment ratio

Construction Steel Record Hit



Shipments of Steel Construction Industry

* Estimate based on comparison of first five months of 1956 against same period, 1955.

skyrocketed, saw an average 79,800 tons per month booked in excess of shipments.

Inventories Low

Conversion structurals are booked solid through third quarter and fresh tonnages will be booked in fourth quarter. Beams are being offered to fabricators at 13.95 cents per lb, for September delivery, (which includes a 4.5 cent extra) f.o.b. as compared with a normal base price for structural of about 5 cents per lb. It's an odd fact that light angles are being offered by secondary suppliers at not much more than mill base prices, but this situation won't last. Wire rod and mesh users are already shipping steel at an f.o.b. price several hundred miles to meet contract commitments.

There are no reserves to cushion the blow. Fabricators tailor the greater part of their steel requirements to the individual job, don't keep strong inventories of shapes. The steel warehousing industry is itself stripped to the bare shelves in its structural departments, can't cushion the blow as it did effectively in 1955.

New Westinghouse Shop

Westinghouse Electric Corp. began construction of a 63,000 sq ft manufacturing and repair plant at Cleveland. The new building, located on W. 160th St., will replace the present M and R site on Breakwater Ave., which will be disposed of when new one is ready.

V. J. Cozzarin, plant manager, said the Breakwater Ave. plant will be turned over to the sales div. for use as a warehouse when the new building is completed, about June, 1957.

Larger Work

It will mean an increase in personnel from 140 to about 250, and will allow heavier cranes to handle larger repair work. The H. K. Ferguson Co. of Cleveland is prime contractor for the building which will be a one story steel and concrete block structure with brick facing. It will be a service center for customers in the Cleveland, Akron, Canton and Youngstown areas.

CONSTRUCTION

BOLTS: Save Building Time

High strength bolts work faster, have greater strength than rivets . . . Construction crews are easier to train . . . Salvage is economical . . . Initial cost is still high—*By G. G. Carr.*

◆ HIGH STRENGTH bolts are becoming one of the fastest-growing trends in the high-stepping construction industry.

In less than five years this method of construction has come up from nowhere to where it now accounts for about 15 pct of steel construction, according to Russell, Burdsall and Ward Bolt and Nut Co., major independent supplier of the high strength fasteners.

Reasons Why

Major advantages include:

1. Cost savings ranging from $3 to $12 per ton of steel erected.

2. Shortened erection schedules with less manpower—A two-man bolting crew can work faster and with greater flexibility than a four-man riveting crew.

3. Stronger joints—Fabricated joints using high strength bolts have proved fatigue strength at least 20 pct higher than those using rivets.

4. Salvage value—Bolted joints need not be cut with a torch nor fasteners chiseled apart.

5. Quieter construction—Bolting has proved less than half as noisy as riveting, an especially valuable attribute in built-up areas.

6. It is more economical to use high-strength bolts as fitting-up bolts, rather than remove them and replace with rivets.

7. Bolts can be tightened with hand wrenches at field locations where power is not readily available.

8. Bolts carry greater load in shear than rivets. The Industrial Fasteners Institute reports that two bolts will safely carry the same shear load as three rivets.

9. Bolts are used cold; there is no fire hazard.

Time Savings

High strength bolts now cost about five times as much as other fasteners. But when time means money, bolts pay off. Bethlehem Steel erected Denver's mile high center—4600 tons of steelwork—in only 82 working days.

In replacing a 50-year-old building at Superior Foundry, Inc., Cleveland, the general contractor was asked to streamline work to reduce production losses. By careful planning, the job was done in only 30 days—against the normal six months. One time-saver was the field bolting of 450 tons of structural steel in seven days, or less than half the time needed for another method of construction.

Bethlehem Steel, a leader in the use of high strength bolts, sums up:

"We have found that the erected unit cost of a high strength bolt is approximately the same as the cost of a rivet. In other words, the high material cost of a bolt plus its low erection cost is about equal to the low material cost of a rivet plus its high erection cost."

Rivets account for about 70 pct of all steel construction. But John Davey, RB&W vice-president, predicts that rivets' big lead will be overcome by 1960.

"Bolting has engineering, economic and worker advantages," he says. "Riveters are getting scarce. It takes years to train a riveting crew, only a few minutes to train an unskilled ironworker to operate a pneumatic impact wrench. The men on the job find their work easier and safer working with bolts. New wrench calibration techniques and equipment have been developed to make bolting foolproof."

ALUMINUM: Behind the Foil Sales Boom

Foil has graduated from kitchen wrap gimmick to full scale production item . . . Market widens from packaging field to industrial uses . . . Construction, electrical, big users—By G. J. McManus.

◆ ALUMINUM FOIL is off on a special kind of a boom. Shipments have doubled since 1952. Nine companies have joined the battle for a market that promises to top 300 million pounds by 1960.

Biggest part of the boom has been in packaging, which accounts for about two-thirds of foil sales. The bright appearance of aluminum foil, its moisture proofing and heat repelling qualities, have brought a major revolution in package and label make-up.

Construction Too

In the industrial and construction fields, foil is finding increased use in cooling systems, electrical applications, insulating panels and aircraft sections.

What makes the foil story so special, though, is not just the increase in sales volume but the way the whole thing happened. Aluminum foil has been around for something like 50 years. Back in the thirties, Aluminum Co. of America dabbled with a foil wrap for home use. Reynolds Metals was beginning to roll with its foil wrap when World War II curtailed production.

But prior to the war, foil was used mostly in tobacco and candy packaging and in a limited number of electrical applications. It was employed during the war to pack certain defense items. Then the fighting ended and Reynolds began its drive to open up the packaging market.

Armed with this home acceptance plus a method of color printing on foil, Reynolds went after packaging business. Aluminum foil labels began appearing on beer bottles. Foil went into sacks and cartons. It was laminated with paper, used as a surface material, a liner, a cap. Disposable foil pans became integral parts of pre-cooked food. Its uses were spreading.

Early this year Alcoa came out with a strong selling program for its foil wrap. Alcoa has put $27 million into new foil facilities and changed its whole marketing approach to emphasize consumer recognition. Kaiser Aluminum, which has been selling a foil wrap on the West Coast, will begin distributing it nationally this year. Revere Copper and Brass is said to be coming out with a Revere Wrap.

Other Fields

All this energy and interest has spilled over into other fields. After a long period of marking time, foil has suddenly blossomed out as a thread for dresses and seat covers, as a lining for fireproof furniture, as a drapery material, as honeycombing for aircraft sections and housing panels.

One of the biggest foil applications may be in cooling systems. The fins of refrigerating units have been getting thinner and thinner. Today, they are under the 0.006 in. size that forms a hazy dividing line between aluminum foil and aluminum sheet. In the automotive field, aluminum producers are hopeful that large scale tests now underway will bring the adoption of foil in radiator fins.

More Applications

Electrical applications of foil go back many years but have jumped recently. Telephone cables are now wrapped with foil for protection against electrical interference. Capacitors for motors, generators, television sets, fluorescent lights and telephone circuits take large quantities of foil.

In home insulation, foil is used in combination with bulk insulators or by itself. It reflects radiant heat. It provides a moisture seal that keeps vapor from penetrating to the house sidings and condensing.

Aluminum Foil Facts

◆ ALUMINUM foil is sheet under 0.006 in. in thickness. For commercial uses it is rolled down to thicknesses from 0.005 in. to 0.00025 in. It is generally annealed for use in a soft condition. One lb of 0.001 in. foil will cover 10,250 sq in.

Shipments of aluminum foil totaled 90 million lb in 1952, climbed steadily to 113 million lb in 1953, 153 million lb in 1954 and 203 million lb in 1955.

In marketing, Reynolds Metals, first big producer, made its first sales push in the home wrap field. An extensive campaign blasted old prejudices against aluminum as a food handling material.

Now foil is a major factor in food and other retail product packaging, is broadening uses in industrial and construction fields.

Alcoa (see photo) dabbled in foil in '30's, now is going into the market in full force. Reynolds is expanding capacity 30 pct.

STOCKS: Don't Let "Experts" Kid You

Steel inventories are not what some pseudo-experts claim . . . Some major items were in short supply before strike began . . . Consumers who thought they were in good shape now not so sure—By *Tom Campbell.*

◆ PSEUDO EXPERT stories on the steel strike would have you believe that it is "good" for the country. Inspired, planted, or uninformed reports on inventories and effects of the strike are misleading. It is inferred that almost everyone has enough steel to last four to eight weeks. But they obscure the fact that some major steel items were in short supply before the strike started.

Don't Feel Bad

Even Dave McDonald, steel union leader, is getting into the act—for his own reasons. He is telling striking members not to feel too badly about being out of work; that there would have been lay-offs later on anyway had there been no strike, since, he says, inventory-laden consumers would have cut back on steel orders.

While this feeling is being dissipated by cold facts those who had thought they had enough steel to tide them over a "few weeks' strike" are not now so sure. What is the blunt run down on the steel situation?

The steel strike odds are: a minimum of one month; a probability of six weeks and a possibility of eight weeks. By that time steel stocks in even the most well-heeled companies will be serious in relation to the amount of business on the books of the steel users.

Both sides were early this week still miles apart. It seemed that it would take some time to bring a meeting of the minds on the 3-year-20-cents-an-hr-first-year package, with less in the second and third years. Where three weeks or so ago things might have been ironed out with not too much difficulty, the outlook now is gloomy.

Almost every point in the steel company offer is being disputed by the union. The latter is set privately for a long hard fight now that the mills have shut down. The management side is just as strongly in favor of testing things out now that it has taken a stand, at the expense and the loss of shutting down.

Whatever comes out of the meetings in Pittsburgh — which may wind up in Washington — it is a sure bet that the union, the industry and steel customers will pay for the long-term contract and stability coming eventually to the industry.

Reports that the Administration is not worried about the strike are not true. While Eisenhower lieutenants do not want to make a public show of their anxiety, it is there nonetheless. At least two Cabinet officers are exerting as much behind-the-scenes-pressure as possible upon both sides. It is hardly likely that this "persuasion" will have too much effect—at least for the next several weeks.

Better Dig In

If the strike is still in progress a week before the Republican convention starts in August the decision will have to be made whether or not to invoke the Taft-Hartley Act. That will be a toughy. The cooling off period would run smack dab into the election week; a horrible political nightmare.

The Ore Picture

The effects of the steel strike and the necessary tough bargaining to settle it are not short term items. What looks like a good stock of steel today will not be so big come Labor Day — or even three weeks from today. The inventory of steel lies heavily among flat-rolled steel users.

Ore will be dangerously short this fall and winter. With the mines down that means that surpluses—a necessity in summer for winter consumption after the Lake season closes—will be non-existent. This could curtail operations this winter. Help can not come from Canada and from South America. Plans there were set long before the strike. Iron Ore Co. of Canada will mine no more than 12 million tons of ore. The ore must sit at Seven Islands, Quebec, until the strike ends.

How The Strike Pinches

▪ It's not the overall inventories, but the one item in short supply that forces consumers to curtail operations. Components cannot be made unless all material is available for fabrication and assembly. Many firms will realize this within the next month.

▪ New plant and equipment orders have not yet felt impact of the strike. But machinery, equipment, and plant construction deliveries are in for extensions in weeks to come.

▪ Walkout repercussions will be felt as far away as second quarter of 1957. Meanwhile, mills still operating are not free to ship as they would like since defense order setasides have been boosted.

PRODUCTION

TIN: Road Ahead Looks Clear

International Tin Council predicts supply and demand balance in 1956 . . . Production steady into 1957 . . . Prices only minor fluctuation—By *F. J. Starin.*

◆ IT LOOKS like smooth sailing ahead for tin consumers.

Here's the outlook:

Production in 1956 will equal that of 1955, about 176,000 tons, enough to take care of any increase in demand. Output in 1957 will be about the same. Price will remain between 90¢ and $1.00 per lb.

This is the view of world tin study groups, tin bureaus and producers, and close followers of the tin market. All agree that the vital factors are (1) International Tin Agreement, (2) disposition of the Texas City Smelter, and (3) labor and prospecting situation in Malaya, the world's largest producer.

The International Tin Council, executive body of the International Tin Agreement, held its initial meeting this month. Paramount on the agenda: (1) an official prediction of a balanced world-wide supply and demand for the rest of 1956, (2) appointment of W. K. Davey, a former London Metals Exchange chairman, as manager of the buffer tin stock.

Buffer stock is a supply of tin and money with which Mr. Davey will sell and buy on the open market to keep supply and demand, and consequently price, from sharp fluctuations.

Tin Hazards

Since the Tin Council consists of both producing and consuming countries on the governmental level, it seems to have a better than average chance of achieving its objective.

Biggest hazard will be keeping internal peace in producing countries. The world's top three producers, Malaya, Bolivia, and Indonesia, with 843 of 1000 total votes assigned to producing members, get most of their tin from a great number of small mines rather than one or two major installations. Scattered, smaller operations are more difficult to control and usually more sensitive.

Contributions for Tin Council operations by producing countries, balancing supply with demand by export regulations, and even lucrative buffer stock purchases, must be equitably assigned or the resulting animosity and resistance could cripple the group.

Smelter Outlook

Malaya has set the pattern for solution of the problem. The country will contribute a combination of money and metal to the Council, and tax the mines according to their current output.

Current consensus of industry is that the Texas City Tin Smelter will go out of existence in January 1957. Now operated by Federal Facilities Corp., the smelter has a capacity of 90,000 tons. It could make a slight profit at 50 pct capacity, but the most tin the smelter ever produced in a single year was 43,500 tons in 1946.

Cost of putting the installation in mothballs is prohibitive. There have been rumors that Bolivia would buy the smelter, dismantle it and transport it to Bolivia piece-by-piece. This is unlikely since the route overland from the South American port of entry to the likely Bolivian site is difficult and costly. Much more likely is sale of leeching, roasting and other equipment which would be useful in smelting of other metals.

From a defense standpoint, Lynn Meakins, director of the Malayan Tin Bureau, points out that al-

EAST meets west in Malayan tin mines. European owned operations are having labor troubles, although workers (including women) are among the highest paid in the country. Bigger problem is rights to new sites.

though Texas City is the largest tin smelter in the world it took only six months to build. Right now the stockpile is bulging with tin equivalent to two years of world production.

Symetain, principle Belgian Congo producer, foresees a temporary surplus when the Texas City smelter closes, but sees this counter-balanced by a slight drop in world production. Reduction will be primarily reflected in less of the leaner grades of ore.

Labor situation in Malaya is difficult, but the trend is toward sta-

bility. Union organizing is in its formative, more violent stages. Principal targets are the European-owned mines because they are generally larger and wealthier.

Immediate problem of many Malayan producers is finding more mining sites. Untapped tin reserves are more than adequate, and Communist terrorist activity is on the wane, making safety no longer a factor in prospecting. However, most of the land is locally controlled by the nine state governments, increasing the red tape. Right now there are four large dredges standing idle, but this situation is expected to be remedied.

One of the best reasons for expecting production to hold up is the fact that producers expect to sell more tin in 1956 than 1955. In fact, Dr. W. E. Hoare, assistant director of the Tin Research Institute, believes that by 1970 annual world consumption of tin for tinplate, tin's biggest market, will be 70,000 long tons.

MANAGEMENT

PURCHASING: Decentralize?

Opinions diverse on the superiority of consolidating or dispersing buying function, survey finds . . . Most firms seek combination of best features of both systems.

◆ "DECENTRALIZED purchasing with centralized controls," is the way most companies put it. In short, according to a survey by the National Industrial Conference Board, buyers consolidate or disperse their operations to cope with individual company problems.

Emphasis is on local buying under rules laid down by top management at headquarters.

Among 54 single-plant companies responding to the Conference Board survey, only three indicated they had decentralized purchasing. But 158 multi-plant firms indicated a wide range of practices.

Duties Divided

Most of the multi-plant companies said that their headquarters office negotiates all contracts, buys major raw materials and common-use items, and handles capital spending. Local units usually are restricted to buying items for maintenance, repair, and operation of plant facilities, emergency materials, and miscellaneous items.

Arguments given for centralized purchasing include (1) savings through quantity buying of raw materials and supplies, (2) buying specialization, and (3) proper allocation of scarce materials.

Chief arguments for decentralization are more flexibility, faster action, elimination of production delays.

About as many companies prefer centralized purchasing as favor dispersed buying and this is reflected in constantly changing company views in regard to buying. Over the past five years one firm in three, the survey notes, has made some reorganization of its purchasing activities. In these shifts, 60 pct were in the direction of dispersing purchasing authority.

Best Yardstick?

Measuring the effectiveness of the purchasing function is another management problem. About one-fourth of the concerns reporting indicated they evaluate purchasing proficiency by the "materials cost variance" method. Generally this is a comparison of the actual cost of a commodity—or what the manufacturer has paid for it—and the current market or standard price.

Other methods cited were inventory checks: judging how close purchasing departments stay within operating budgets, and comparing actual production costs with budgets or appropriations. Some firms measure purchasing office efficiency by making quantitative analyses of such things as volume of work and unit costs.

Most companies responding to the survey agreed on one thing—the perfect method for measuring effectiveness of the purchasing function has yet to be found.

Major Ore Discovery

A major deposit of columbium ore has been discovered by Dominion Gulf Co. in Northern Ontario.

Preliminary drilling suggests that large tonnages may be easily and readily mined. Location is 17 miles northeast of a town called Chapleau, on Lake Nemegosenda.

Air survey, with the airborne magnetometer suggested the possibility of columbium in this area. X-Ray core drilling convinced company geologists the deposit was large enough to be of major importance.

Discovering company is a subsidiary of Gulf Refining Co., which is wholly owned by Gulf Oil Corp., Pittsburgh.

FREIGHT: Changes Are In The Wind

Decision on changes in Interstate Commerce Commission Act is postponed until 1957 . . . Railroads vs truckers now takes on political twist . . . Might mean lower freight rates.—By *R. O. Schulin.*

◆ WHETHER metalworking industries will be paying higher or lower freight costs in the near future depends on the outcome of recommendations made by the Presidential Advisory Committee on Transport Policy and Organization for revising the Interstate Commerce Commission Act.

In the main, the recommendations would give common carriers — predominantly railroads — a freer hand in setting rates.

Contract truckers and the American Association of Railroads battled down to the deadline in a Congressional hearing, and loaded the House Subcommittee on Interstate and Foreign Commerce with so much testimony that it postponed judgment until 1957—when next Congress convenes.

Now the proposed changes depend, in some extent, to the outcome of the November election. It's a sure bet that railroads and truckers will be exerting pressure to see that candidates who favor their respective cause get into office.

The railroads are hoping that freight rates will be tossed into the competitive stew after 50 years tight regulation in order to meet growing competition from the trucking industry.

Railroads Slipping

Prior to World War I, the railroads hal nearly all the freight business to themselves. But by 1939, trucks had won 9.19 pct of the total, while railroads had 64.39 pct. Inland waterways accounted for 16.74 pct and oil pipelines handled 9.67 pct.

By 1955, the trucking industry had doubled its share—accounted for an estimated 18 pct of the total. The railways garnered barely 50 pct of domestic freight shipments. Pipelines had increased to 13.64 pct, while inland waterways' share remained stable.

To the railroads, the sore spots in the present ICC policy are (1) the fair-share concept, in which the Commission attempts to allocate freight traffic between the several modes of transportation and (2), the minimum rates issue, where the Commission has power to determine and fix precise freight rates.

The railroads claim that the ICC can, and frequently does, prevent railroads from reducing rates to compete with trucks and barges, while it is completely powerless to prevent trucks and barges from manipulating rates. Two-thirds of all trucks and nine-tenths of all barges are exempt from ICC regulations.

Another sore spot with the railroads is the $50 billion highway building program passed recently by Congress. They say it represents a further boon to the truckers at the expense of the public.

Truckers' Stand

But the truckers see at least a temporary victory in postponement of Congressional action. Sen. Wayne Morse, banner-carrier for the truckers, claims the Advisory Committee's recommendations are railroad-inspired and represent big business favoritism.

Truckers apparently fear that the railroads would launch into a merciless rate war, once given a free hand. In this respect, the railroads would have the advantage, since their out-of-pocket expenses are low compared to their fixed costs. The truck companies, on the other hand, have proportionately high operating expenses.

Other quarters fear that such a rate war would undoubtedly spread among the railroads themselves and result in reducing their revenue in the long run, instead of increasing it. Tight regulations were clamped on the railroads in the first place for that reason. If the railroads get into such a pickle, the probability is strong that they might have to be nationalized, economists point out.

End Of Steam Locomotive Era Approaching

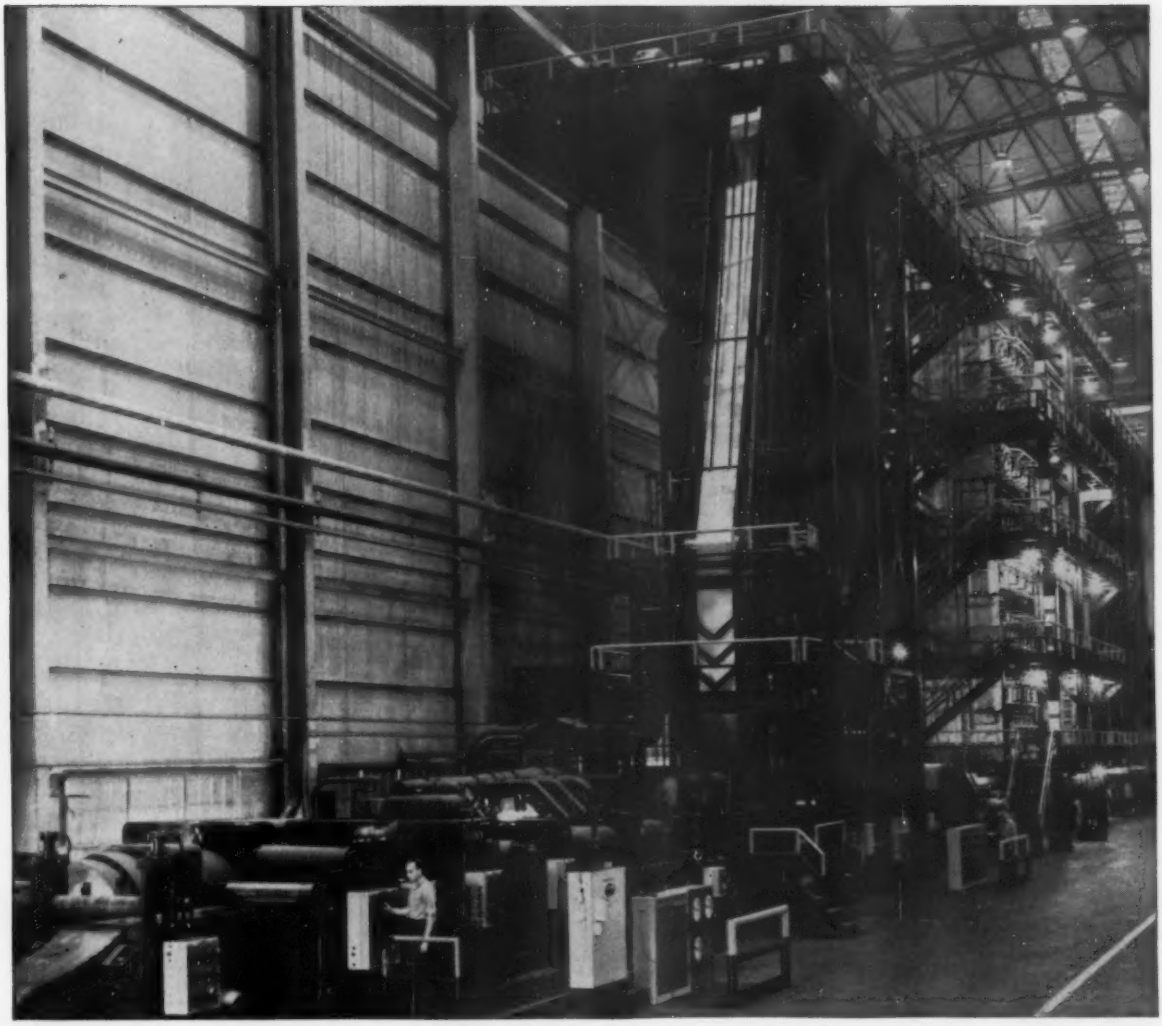
The vanishing steam locomotive which once ruled America's railroads got another nudge toward oblivion.

Southern Pacific announces setting aside $24 million for replacing 154 of its remaining 405 steam engines with diesels. The road has 2,102 diesels in operation at present.

Most of the nation's retired steam locomotives have been scrapped, but some railroads have turned a number over to communities along their lines.

The old iron horses now grace city squares and museums. They captivate the imagination of children and recall to oldtimers those nostalgic days when steam was king.

B.F.Goodrich



Rubber stretches a mile of steel

A typical example of B. F. Goodrich improvement in rubber

THAT'S a mile-long strip of steel on its way to becoming tin cans. To toughen steel, they run it through that continuous annealing line at speeds up to 900 feet per minute. It does in 20 minutes what used to take two days. But for a while it looked like one of those good ideas that just wouldn't work.

The trouble was with the rubber-covered rolls that keep the long strip moving. After just a few hours, the rubber was worn smooth and shiny with rubbing plus high speed. Then the rolls couldn't grip, the steel smeared and couldn't be used for cans.

B. F. Goodrich engineers worked on the problem, and came up with a new rubber compound that helped make this process really practical. Rolls covered with the special rubber don't slip, don't glaze, don't mar the finish of the steel. And, in the mill shown here, B. F. Goodrich Strip-Grip rolls are lasting 10 times longer than the rolls used before.

Finding a way to improve steel mill rolls is an example of the B. F. Goodrich method of approaching a customer's problem. We have been able to solve equally difficult ones, just as successfully, in p roducts you undoubtedly use. Your B. F. Goodrich distributor would like to tell you what these improvements are, and how they can be employed for your profit. *B. F. Goodrich Industrial Products Company, Dept. M-695, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

EXPANSION IN INDUSTRY

Reactors:

Bill will make AEC build prototype units.

A bill instructing the Atomic Energy Commission to spend $400 million building prototype atomic power reactors is pending in the House after Democrats rammed the bill through the Senate over Administration opposition.

The measure contemplates that three large-scale reactors (at least 100,000 KW) and two smaller reactors (between 10,000 and 20,000 KW) will be built. It breaks sharply from the 1954 Atomic Energy Act which was designed primarily to promote private development of atomic power.

Vigorous opposition to the proposal has been voiced by industry generally, and electric utilities particularly. Atomic Energy Commission officials also oppose it, arguing that the government should lead in developing nuclear technology, but private industry should take the initiative in building large-scale reactors.

The bill, sponsored by Sen. Gore, D., Tenn., attempts to avoid the public vs. private power issue by stipulating that all reactors will be built at AEC installations and provide power only to the government.

Republican opposition to the measure centers on the charge that it is unnecessary and may slow civilian and military atomic development.

Democrats supporting the proposal say it is necessary to assure American supremacy in reactor development. Sen. Gore insists that development of atomic power by private industry has been "disappointing," and that at present rates of construction, Russia will be out-producing the U. S. by 1960.

The abundance of other sources of energy provides little immediate incentive for private development of atomic power, declares the bill's sponsor.

One provision of the measure gives Congressional sanction to President Eisenhower's contemplated International Atoms-For-Peace Agency.

While giving AEC the final word as to whether, where, how many and what type of reactors will be built, it directs the Agency to report to Congress on the "need" for federal construction four times a year, beginning January.

ELECTRIC typewriters are rolling off assembly lines in International Business Machine Corp.'s new Kingston, N. Y. plant 8 pct faster than at the previous installation. Production of these machines will be further increased with construction of another new plant at Lexington, Ky.

Expansion Briefs

Foote Mineral Co., Electromanganese Div., Knoxville, Tenn; expansion of production facilities; cost about $2 million.

Luria Engineering Co., New York; designers of standardized steel industrial building; new fabricating plant at Chicago Heights, Ill; expected to increase output 100 pct.

Datamatic Corp., Newton Highlands, Mass; development and production of large data processing systems; new structure to enlarge plant facilities.

Bowser-Morner Testing Laboratories, Dayton, O; establishment of a research and development dept; aimed at providing small and medium firms with product development service.

Jones & Laughlin Steel Corp., Pittsburgh; search for additional ore reserves extended to Ashland County, Wis; optioned land being explored.

CHAIN NEWS!

NEW "*Electrolized*" ATLAS ROLLER CHAIN

NON-CORROSIVE . . . COSTS 40% LESS

Here's a revolutionary new roller chain developed to meet the most exacting requirements of the chemical, food, bottling and other industries where corrosion is an important factor. Stands the most severe torture tests . . . meets and beats A.S.C. specifications . . . yet costs far less.

STAINPROOF, CORROSIVE RESISTANT Electrolized parts came through severe salt spray corrosion tests with flying colors . . . last as much as 800% longer.

HIGHER TENSILE STRENGTH Has same tensile strength as alloy steel chain . . . much higher than bronze or stainless steel chain.

WEARS LONGER Friction of parts has been reduced by more than 50% . . . wear cut to a minimum . . . chain life greatly increased.

LOWER PRICE Atlas Electrolized Roller Chain is as much as 40% lower in price than any other corrosion resistant chain now on the market.

TESTED AND PROVED!

This new Atlas Electrolized Chain has been torture-tested on installations and tested in laboratories. It has successfully resisted the action of salts, chemicals, detergents, acids, caustics, alkalis and many other corrosive elements.

Get the facts on this new chain for use where corrosion tensile strength and long wear are important . . . as well as low cost. Write Atlas Chain and Manufacturing Company, West Pittston, Penna. Act now and

SEND THIS COUPON FOR SAMPLE

Please send sample of Atlas Electrolized Chain and data to—

NAME_____ TITLE

COMPANY_____

ADDRESS_____

INTRODUCING GRAPH-AIR...

a tougher, more versatile graphitic tool steel that air-hardens at temperatures 200° to 300° lower with less distortion!

NO facilities for oil-quenching—or other relatively costly heat treating processes? Need a finer air-hardening tool steel? Then specify *Graph-Air,* newest steel resulting from the Timken Company's pioneering in fine alloy steels. Latest addition to our line of quality graphitic tool steels!

Graph-Air tool steel air-hardens at temperatures of 1450°F to 1550°F—200° to 300° lower than most other air-hardening tool steels. And because Graph-Air *is* air-hardened, there's less distortion, easier heat treating control, less decarburizing. As a result, Graph-Air can be made into *more intricate sections.* Graph-Air is a tough air-hardening steel, too—made to order for such demanding applications as blanking dies, or any tool steel part which must take hard abuse.

Besides all the advantages of air-hardening—economy, less drastic reactions to quenching, less tendency to scale—Graph-Air offers greater wear, machinability and stability. Like Graph-Mo, Graph-Air will outwear other tool steels, because of the uniform diamond-hard carbides in its structure. And Graph-Air machines 30% faster. The free graphite in its structure acts as a built-in lubricant. And Graph-Air stays *accurate longer,* is fully as stable as other Timken Company graphitic tool steels, which are the most stable tool steels made!

Growing out of the Timken Company metallurgists' long experience with fine steel making, Graph-Air—the *new* graphitic tool steel that can be air-hardened at *low* temperatures—will be available in both solid and hollow bar sizes. For more information, write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

TRADE-MARK REG. U.S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

REPORT TO MANAGEMENT

Accentuating the Positive

If anyone had any doubts, the steel strike underlined in a very short time the top speed in which the economy was operating. Some major industries were brought to a halt in a matter of days. After two weeks, unemployment became critical in some areas.

This points out that business had been operating without any significant bulge. Only in automotive, and to some extent appliances, had any great inventory buildup occurred.

Even before the strike began, some of the pessimists who had been predicting a serious third quarter decline began to hedge. Continued high level of most business indicators, which stubbornly refused to follow the business cycle, made gloomy predictions out of the question.

How Much Will the Strike Hurt?

One serious effect of a strike lies in the possibility of a significant depression of consumer purchasing power.

Steelworkers and others indirectly affected are up to their ears in installment debt, as are most of the nation's wage earners. Obviously, a strike of any length puts a crimp in their buying plans.

On the other hand, the threat of cutting off production of cars, appliances or other consumers goods may have the effect of making buyers out of those who were only considering a purchase.

The real economic prop against a post strike letdown is the fact that business and industry have not changed their plans to spend for capital improvements and expansion. Furthermore, the vast highway program is just about to get under way.

The Big Spending Continues

Capital goods and construction were most hard hit by the steel strike. Thousands of construction workers were laid off immediately because of shortages of structurals. The plate famine had similar effects in heavy goods industries.

As soon as steel is available, these industries will continue with added zest. With business going forward at a faster clip, consumer confidence, if it was shaken by the strike, will return with vigor.

What it means is that the business outlook for the rest of the year will be excellent, with only the possibility of continued shortages to throw a damper on the outlook.

The Power Factor

There is no better barometer of business activity than the rate of consumption and sales of electric power. That's why the plans of the power industry are important to business and industry. (See Special Report, p. 67.)

Because they are obligated to serve the public, utilities have to anticipate the needs of their own areas, both industry and residential. If the electric utilities are expanding at a rate of $3 billion a year, and increasing that amount to $6 billion within ten years, it indicates a greatly expanding economy.

It also indicates changes in industry that may compare with anything since the industrial revolution. Today's industrial worker consumes slightly over 9 kwh per man hour. By 1975 the figure will reach 19 kwh.

Availability of power will also have a significant effect on the geographical location of industry. Switch from hydro-electric to steam generated power, for example, has been the real factor in the location of power consuming industries in the Ohio River valley.

INDUSTRIAL BRIEFS

Mississippi River Boat . . . Mississippi Valley Barge Line Co. has awarded a contract to Dravo Corp., Pittsburgh, for the construction of a new 200-foot river towboat. The new vessel will be a sistership of two other towboats built last year, the "Valley Transporter" and the "A. D. Haynes II." Delivery is scheduled for late in 1957.

Counting Rupees . . . Dr. Weldon B. Gibson, associate director of Stanford Research Institute, is sending a team of four industrial economists to India to assist with the development of small industries as a part of India's Second Five-Year Plan. The group will work under an SRI contract with India's Dept. of Commerce and Industry.

Jules Verne . . . General Electric has received a contract to develop super-sensitive instruments capable of operating many years without maintenance, for the U. S. Navy's atomic submarines. A $350,000 allocation from the Department of the Navy is financing the project.

Controlled Controls . . . Agreements have been reached giving Robertshaw-Fulton Controls Co. the right to manufacture and sell control devices developed by Bergen Research Engineering Corp., of Teterboro, N. J. Valves will be manufactured and sold by the Bridgeport Thermostat Div. at Milford, Conn.

With Champagne . . . Metal & Thermit Corp., dedicated its new general office building, recently completed as part of a $2,500,000 combined general office, research and distribution center, in the Woodbridge-Rahway area of New Jersey.

Pipeline To The Top . . . The American Society of Civil Engineers has authorized the establishment of a Pipeline Div. which is now in process. Its interests and activities have been conducted by the Committee on Pipelines of the Construction Division. New group status gives the society a total of fourteen technical divisions.

Fines Payoff . . . Increased pig iron production and effective use of ore fines and blast furnace flue dust are expected to result from the installation of a new Dravo-Lurgi iron ore sintering plant at the Ashland, Ky., works of Armco Steel Corp. Along with the sinter plant, Dravo will install a Walker Process flue dust thickener.

A Dow Bow . . . Dow Chemical Co. has announced the formation of its Eastern Research Laboratory at Framingham, Mass. Dr. Fred W. McLafferty has been appointed director.

Bliss In Brooklyn . . . E. W. Bliss Co., Canton, O., has acquired ownership of John Robertson Co., Inc., Brooklyn, N. Y. The Robertson Co. will operate as a wholly owned subsidiary.

Search and Research . . . The Parma, O., research laboratories of National Carbon Co., Div. of Union Carbide and Carbon Corp., will be dedicated September 18. Designed primarily for basic research in chemical and solid state physics, the multi-million dollar laboratory brings to seven the number of major research centers operated by divisions of Union Carbide and Carbon Corp. Total research cost in 1955 was $43 million.

Too Late For Byrd . . . An arctic shelter, erected in 90 minutes by seven men under ideal conditions, has been developed by the Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va. Capable of withstanding winds of 100 miles per hr and snow loads up to 75 lbs per sq ft, the building has been adopted by the Army for use as barracks, communications shelters and first aid stations.

Look, No Hands . . . Alabama Pipe Co., of Anniston, Ala., is closing its branch plant at Talladega, Ala., effective in Mid-August. The plant has been using hand methods of moulding cast iron fittings. Nearing completion at Anniston, Ala., is a new multi-million dollar plant to manufacture its products by mechanical means. Move will consolidate all operations there.

Management Alloy . . . National Lead Co. and its subsidiary Morris P. Kirk & Son, Inc., of Los Angeles, has acquired the controlling interest in Pioneer Aluminum, Inc. This company has been formed to consolidate and carry on the activities of Pioneer Aluminum Supply Co., Pioneer Tool Engineering Co., Consolidated Casting Co., and Republic Smelting and Refining Co.

How Great Lakes Steel *molds* quality

As molten pig iron gushes from the world's largest blast furnace, a generous cupful is ladled out into small, trough-like molds.

Cooled and solidified, these "guinea pigs" (samples of the iron that goes into open-hearth steelmaking) are then rushed to Great Lakes quality control laboratories. For they hold a big chunk of the secret to producing steel that meets customer specifications *all down the line!*

They tell if the blast furnace burden is precisely balanced. They tell if as many impurities as possible have been eliminated. They help tell just what "seasoning" must be added to the open hearth charge, so every batch of steel has the desired chemical composition and drawing qualities—and no buts about it!

Quality control *every* step of the way! That's our job at Great Lakes Steel . . . that, and the kind of service you expect—*and get*—from just one phone call.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Mich. • A Unit of

NATIONAL STEEL CORPORATION

LARGEST IN THE WORLD and first with a hearth diameter of over 30 feet, the No. 1 Blast Furnace is one of four at Great Lakes. Thanks to constant control, these furnaces produce iron that, beyond question, spells higher quality steel.

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

Delayed Sales Spurt Leveling Off

Upward trend begun in May holds steady in July . . . New car stocks down to 700,000, reflect heavy production cutbacks . . . August schedules far below last year . . . Steel inventory no problem—By T. L. Carry.

◆ THE PRESENT optimistic sales reports coming out of Detroit should be taken with a grain of salt.

It's true that sales began to pick up toward the end of May and through the month of June. So far in July, they have held at a steady but rather unspectacular pace.

At the same time, new car stocks have been reduced and are now hovering around the 700,000 mark. It is being cautiously predicted that the number of cars on hand by Aug. 1 will be cut to 550,000.

The reduction in stocks are more of an indication of the heavy cutbacks the industry has made in its production schedules rather than any sudden spurt in sales. As one auto executive puts it: "Sales began to pick up noticeably in May and the market is now moving in a horizontal direction rather than upwards."

Production Low . . . As a result, there is little hope for any big improvement in production schedules, although individual companies might increase their output slightly from time to time in order to balance demand with what they consider reasonable dealer inventory.

It is unofficially estimated that production schedules for August call for the industry to make around 200,000 cars, which is just a little bit better than some weekly yields during the record 1955 run.

Main reason for the drop will be model changeovers but the necessity to cut stocks of old models is also a factor.

August Turning Point . . . The present market situation is one of the biggest reasons that automakers are not too concerned with the steel strike.

Either through design or by accident, producers have enough steel on hand to finish out their 1956 model runs.

However, it is generally conceded that if the strike lasts beyond Aug. 1, the industry is going to be in trouble.

Here's why:

Parts suppliers will start production for the 1957 models in August, approximately one month before the automakers start producing cars.

Warehouse Aid . . . Assuming that it will take at least 30 days to fill the bins after the steel strike is settled, parts people feel that they couldn't balance their inventories enough to be in full production until about the end of September.

Their one hope in such a situation would be warehouses in the area. Stocks, particularly of flat-rolled products, are reportedly adequate enough to take care of any reasonable demand.

How Oldsmobile Beats the Heat

◆ OLDSMOBILE fights summer heat in its forge shop with an evaporative cooling system, perhaps the first to be installed in a major forging operation.

Capacity of the system is rated at 50,000 cu ft of conditioned air per minute. This means that every hot metal worker on the press forging crankshaft line will be blanketed with 5000 cu ft per minute of air moving at a velocity of 3000 ft per minute.

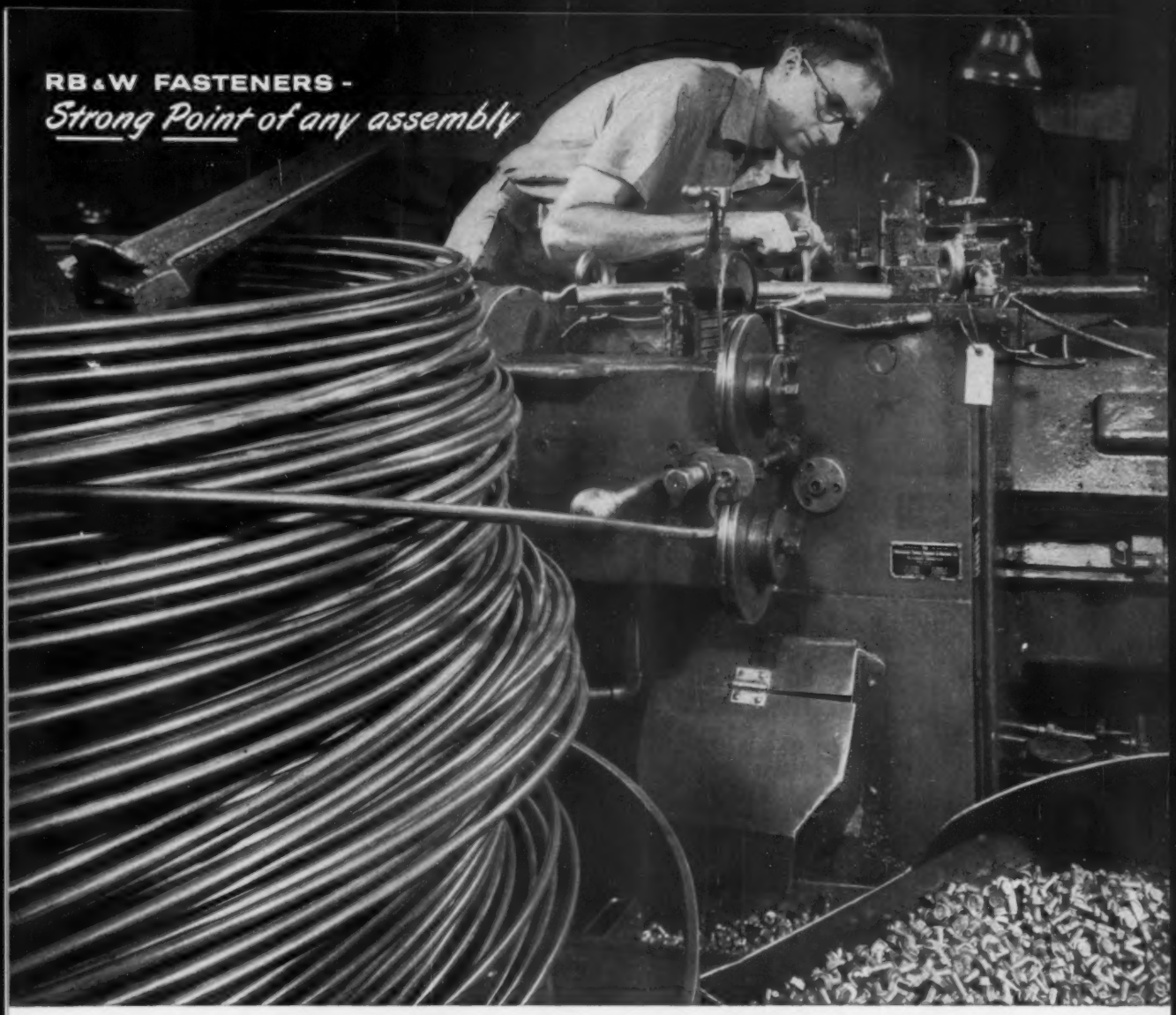
Installation was developed for the division by industrial hygienists at the GM Technical Center. A temporary system was first developed at the Center.

Antitrust:

Justice Dept. expands GM, Ford actions.

Antitrust attorneys in the U. S. Justice Dept. are preparing to spend more time developing complaints against the automobile manufacturers, particularly General Motors and Ford.

Already filed before a federal



Getting set to pound some strength into bolt heads

HERE ARE three essentials for producing strong, low cost fasteners ...an ingenious machine, indispensable skill and proper material.

That's a cold header you see. It deals wire terrific blows, forcing it to flow cold inside dies. Skillfully set up, it spills out bolt or screw blanks by the thousands per hour—all with *strong*, sound heads.

Making precise adjustments on the machine is Douglas Dunaway. With RB&W for ten years, he's one of many long-timers whose experience assures high quality output from a vast array of modern equipment.

The cold heading method (an RB&W development that revolutionized bolt making) calls for use of uniform, high quality raw material. With constant quality control, RB&W makes *sure* cold headers get the proper "diet".

It's this combination of facilities, experience and quality control in all RB&W plants that assures more fastener quality for your money . . . a truly reliable supply source . . . and strong fasteners that never let you down.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B & W

110th year

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors** from coast to coast.

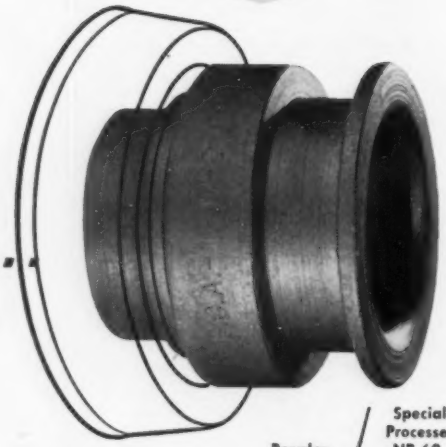
"SWITCH!" said Ostuco

. . . and savings were surprising!

Pleasant surprise, too! Bearings Company of America, Division of Federal-Mogul-Bower Bearings, Inc. Lancaster, Pa., was machining OSTUCO seamless tubing to make a clutch release bearing collar used as original and replacement equipment. Results were fine!

Then word came from OSTUCO, recommending a switch to OSTUCO's newly developed NP-60, tubing specially processed for machineability. Cost was slightly higher, but BCA and OSTUCO engineers predicted the savings would justify the change.

they switched . . .



. . . and they SAVED!

	Regular	Specially Processed NP-60
Production per 8 hour shift (units)	675	840
Production time per 1000 units (hours) . . .	12.35	10.03
Total Labor per 1000 units (man-hours) . .	13.09	10.63

Besides the savings, Bearings Company of America was pleased with the better finish of the new part. They point out that the collar in photo above "shows the finish as it comes directly off the machine."

It happens this way often enough to warrant checking with OSTUCO about your tubing applications and production problems. Contact your nearest OSTUCO Sales Engineer or write direct to the Shelby factory —there's no obligation!

OSTUCO SHELBY, OHIO

OSTUCO TUBING

SEAMLESS AND ELECTRIC RESISTANCE
WELDED STEEL TUBING—Fabricating and Forging

OHIO SEAMLESS TUBE DIVISION
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CANADA, RAILWAY & POWER ENGR. CORP., LTD.
EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
225 Broadway, New York 7, New York

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
JULY 14, 1956	121,926	23,093
JULY 7, 1956	75,829	13,407
JULY 16, 1955	177,260	30,367
JULY 9, 1955	143,400	23,888

*Estimated. Source: *Ward's Reports*

court in Detroit is a government suit against GM, charged with illegal efforts to tie up the bus market.

A separate case now hinted at by Justice Dept. would attempt to show that GM exerts an excessive amount of economic power in its production and sales of passenger cars.

Declining to narrow its current antitrust activities to the single largest automotive producer, Justice Dept. also has its sights on Ford. Robert A. Bicks, speaking for the Antitrust Div., reveals that Ford is a target because it allegedly has forced dealers to sell only Ford-approved or Ford-made parts and accessories.

Investigation of the Ford parts distribution system has been in progress since 1953, Mr. Bicks says. It probably will continue for some time before Justice Dept. feels it has a case, though Mr. Bicks holds that material collected so far may indicate an antitrust violation.

Ford firmly denies the complaints which Justice Dept. says it has received from dealers and from independent producers and jobbers of parts. Ford's position, as described by the department, is that it removed the exclusive sales requirement in 1949 but still claims the right to demand that dealers do not describe or sell as genuine Ford parts any parts not made or approved by Ford.

Ford Freight Utopia

The latest materials handling methods are being used at the new Ford pool car terminal in Detroit. More than 2 million lb of freight can be handled daily at the terminal, which Ford uses as a main shipping point for its parts and supplies to assembly plants and parts depots.

The huge new terminal, leased to Ford by the Wabash Railroad, has loading space for 104 rail cars and unloading space for 122 trucks simultaneously.

Unloading docks at the facility are equipped with hydraulic "levelators" which are adjustable to the height of each truck bed. Fork lift unloaders can then be driven directly into the trucks and pick up loads which arrive on wooden pallets.

To move the freight to rail car locations, freight handlers place their loads on carts which are towed automatically up and down the terminal by a conveyor system installed in the floor.

Rail cars are lined up four abreast in the terminal and steel bridges are placed between them so that employees can drive their loaded fork lift trucks through and load the cars farthest from the dock.

The new terminal replaces two older Ford car pool locations which had a combined capacity of 750,000 lb of freight daily.

According to Howard C. Sullivan, material control manager, the old facilities did not offer enough protection from the weather. At the new terminal, canopies extend for 28 ft on either side of the dock. This gives complete protection to the rail cars and to all but the longest trucks.

Chevrolet Is Ahead

Chevrolet continues to dominate the new car market. Retail deliveries for the first six months of this year totalled 850,566 cars. It is the second best 6-month period in Chevrolet history and only 1.5 pct under the same record-breaking period in 1955.

In addition, the GM div. captured more than 25 pct of the market—its largest penetration in 20 years. Up to the end of May, registrations show that Chevrolet is leading in the sales race with Ford by a whopping 11,500 vehicles, a large bulge.

THE BULL OF THE WOODS By J. R. Williams

CAN'T SAVVY THAT! WITH A PALACE OF AN OFFICE NOW, HE GITS SENTIMENTAL OVER TH' DINGY LITTLE OFFICE WHERE HE SPENT MOST OF HIS YOUNG DAYS ON TH' ROAD TO SUCCESS!
HE'S NO DIFF'RENT THAN OTHER PEOPLE, ONLY IT AIN'T A VINE-COVERED COTTAGE-- HE THINKS OF GEARS HUMMIN' STID OF BEES--MACHINE BELTS SHRIEKIN' STID OF BIRDS SINGIN'--TH' SMELL OF FRESH-TURNED STEEL STID OF SOIL-- OH, I COULD GO ON!
J.R.WILLIAMS
7-18
IRON IN THE BLOOD
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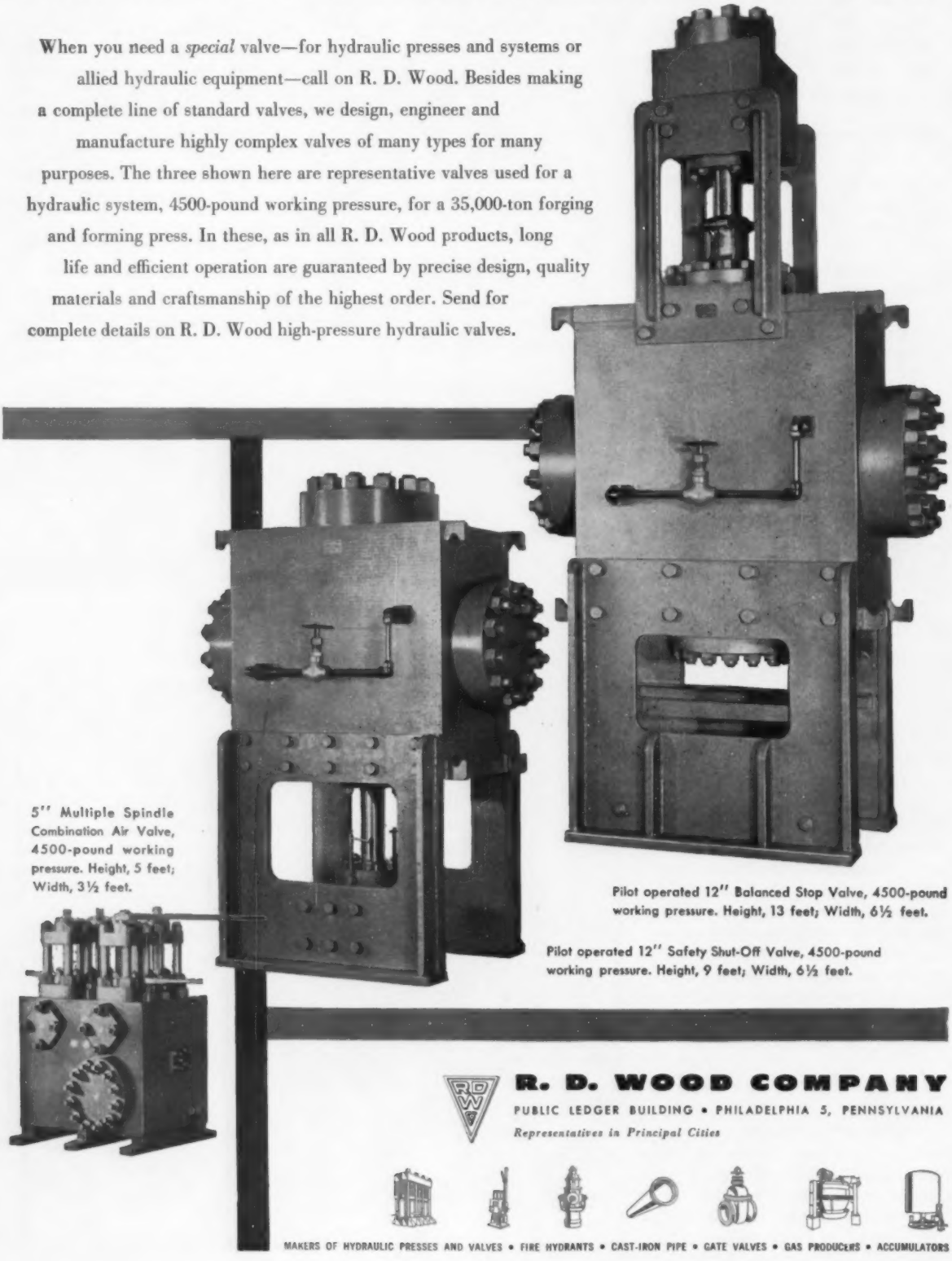
SPECIALISTS IN HIGH-PRESSURE VALVES

When you need a *special* valve—for hydraulic presses and systems or allied hydraulic equipment—call on R. D. Wood. Besides making a complete line of standard valves, we design, engineer and manufacture highly complex valves of many types for many purposes. The three shown here are representative valves used for a hydraulic system, 4500-pound working pressure, for a 35,000-ton forging and forming press. In these, as in all R. D. Wood products, long life and efficient operation are guaranteed by precise design, quality materials and craftsmanship of the highest order. Send for complete details on R. D. Wood high-pressure hydraulic valves.



5" Multiple Spindle Combination Air Valve, 4500-pound working pressure. Height, 5 feet; Width, 3½ feet.

Pilot operated 12" Balanced Stop Valve, 4500-pound working pressure. Height, 13 feet; Width, 6½ feet.

Pilot operated 12" Safety Shut-Off Valve, 4500-pound working pressure. Height, 9 feet; Width, 6½ feet.

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Representatives in Principal Cities

MAKERS OF HYDRAULIC PRESSES AND VALVES • FIRE HYDRANTS • CAST-IRON PIPE • GATE VALVES • GAS PRODUCERS • ACCUMULATORS

Fast Tax Aid for Steel in the Works

Government may re-examine need for steel capacity . . . Road program, need for oil country and construction steel prompt second look . . . Steel price probe is still alive, but moving slowly—By G. H. Baker.

◆ THE GOVERNMENT is getting ready to take a fresh look at the need for additional steel capacity. As a result, there's a better-than-even chance that fast tax amortization will again be offered as an incentive to get new capacity built.

At the present time, almost all of the so-called "expansion goals" relating to iron and steelmaking equipment have been met, which means that fast write-offs are no longer available for most types of new capacity. (Heavy plate is one of the few steel expansion goals still open.)

Re-opening Likely . . . The tremendous demand for steel from certain segments — notably the huge new $50 billion highway program, the seemingly insatiable demand for oil-country goods and pipe of all types, the mushrooming school construction program — makes government planners believe that the time is at hand to "re-examine" the fast write-off possibilities for steel-making, in order to get additional capacity to take care of the steadily increasing demand.

Present plans call for the review of present capacity to take place during the next three months. At the end of this time, there is a possibility that the government will announce that it is "re-setting" or "re-opening" several of its steel-making expansion goals so as to provide for fast amortization of new construction.

Price Probe Active . . . A proposed congressional investigation of steel industry price and wage policies is still on the "active" list, although it is moving slowly.

There is little chance now that it will get underway before next fall.

The Senate-House Economic Committee, headed by Sen. Paul Douglas, D., Ill., is now digesting material collected over the past year to present to the full committee before adjournment, about August 1. Sen. Douglas is certain the full committee will go along with his plans to hold the probe as the first step in a general price-wage study.

Political Hay . . . Since there is little chance to get hearings underway before adjournment, and there will be little chance of getting any congressmen to sit as investigators at least until after the national nominating conventions, the hearings are not expected to get started until next fall.

There is a chance that Sen. Douglas will try to slip the hearings in between the conventions and the elections if he thinks there is some immediate political hay to be reaped.

Timing of the proposed hearings will probably depend some on how soon steel price increases —or intentions to raise prices— are announced by the industry following the union settlement.

Probe will try to develop criticism of the industry for allegedly raising prices more than is justified by wage increases, and for paying for expansion out of profits, rather than out of capital.

More for Missiles

Spending for guided missiles is going to double during the next two fiscal years, a group of labor union economists estimate.

Figures prepared by the AFL-CIO Machinists indicate that total expenditures for guided mis-

SEC Wants More Policing Power

Securities and Exchange Commission is asking control over stock options of 1200 corporations. A last minute drive is being made for legislation.

Major objective is to permit SEC to require "adequate" financial reports to stockholders in any firms with $2 million or more in assets and at least 750 holders of any equity securities.

Second objective is authority to police solicitation of proxies for voting at company meetings.

An SEC survey indicates 21 pct of firms were delinquent in reporting on financial details; 73 pct of proxy solicitors failed to identify nominees for election at annual meetings.

Planters, watering pots, home decorations and giftware by BURKART, Yonkers, N. Y.

For Beauty that you can't "polish off"

...GET SOLID BRISTOL BRASS

Heirloom beauty that lasts undimmed through generations . . . that's what this leading maker of planters, home decorations and giftware guarantees to all customers. And when they underline the quality of these fine products, they simply say: "They're *solid* Brass."

And we're proud to say that Burkart's solid Brass comes from the modern mills here in Bristol. For quality and dependability are two things on which Burkart and Bristol see eye to eye. And if you see it the same way, then why not test the truth of what we say . . . that in strip, rod, wire and forgings . . . Bristol-fashion means everything shipshape and right on time. Just call Ludlow 2-3161.

THE BRISTOL BRASS CORPORATION

has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester, Syracuse. The Bristol Brass Corporation of Ohio, 1607 Broadway, Dayton.

...and for BRASS FORGINGS, too...get them from **ACCURATE BRASS CORP.** (*Subsidiary of The Bristol Brass Corporation*) now in a new and modern plant at Bristol, Connecticut

"Bristol-Fashion" means **Brass at its Best**

siles will take nearly 40 pct of the total Air Force budget by fiscal 1959. Currently, missiles take about 20 pct of every Air Force dollar.

Union officials, not to be caught napping as to the organizing possibilities in the rapidly-growing missile program, point out significantly:

"This is a very important trend that our association must not overlook.

"Missile operations do not necessarily represent supplemental business with airframe companies.

"To an extent, steady growth in guided missiles will help to offset the gap in normal aircraft sales that is likely to develop over the long run in the switch from piloted to pilotless aircraft."

Stockpile:

Government stops buying nickel, copper, aluminum.

The government has decided to omit purchases of nickel, copper, and aluminum in the next 12 months. This means that fiscal 1957 will be the first year since World War II that the government has not been an active buyer of these metals.

Government decision to drop copper and aluminum from its shopping list is a direct reflection of the relatively plentiful supplies, and also of the fact that government stockpiles of these two metals are overflowing.

Nickel Still Serious

In the case of nickel, the government regards the supply situation as "serious," and says it will not resume any buying of nickel for the stockpiles until military contractors are getting all they need and civilian manufacturers are getting at least a good percentage of what they need.

Commodities still on the purchase list for fiscal 1957 are:

Antimony, asbestos (amosite), chromite (metallurgical), diamonds (bort), fluorspar (metallurgical), iodine, lead, magnesium, manganese (battery type, synthetic dioxide), manganese (chemical, types A and B), mica (muscovite block and film), mica (phlogopite splittings), opium, selenium, shellac, silicon carbide, talc (steatite block), and zinc.

Floods:

Insurance Bill Ready for Adoption.

House leaders among both the Democrats and Republicans are asked to act quickly on a bill setting up a $3-billion flood insurance program backed in part by federal funds.

All 12 New England senators, recalling devastation caused in their states by early-fall hurricanes and floods, urge the House to take care of this measure promptly. It passed the Senate by a hefty majority in May and has just been approved, with amendments, by House Banking Committee.

Planned to run for five years, the insurance program would permit federal subsidies of 40 pct of the premiums on policies covering business properties and homes. Senate version would require the states to split the subsidy costs with the federal government after the first three years.

Original $3-billion limit on the program could be raised to $5 billion by the President if the demand for coverage warranted the increase. Maximum amount of subsidized coverage for an individual or business is set at $250,000. A limit of $10,000 is placed on a policy for a home.

Pollution Help

State and cities are now eligible for $515 million in aid to help them construct water pollution and sewage treatment projects.

Under a measure signed by President Eisenhower, the federal government will provide up to $500 million to help finance construction projects. Aid will also be available for pollution research. Construction grants will be limited to 30 pct of each project, or $250,000, whichever is smaller.

The new law also will step up federal enforcement of anti-pollution regulations on interstate streams, which industry is required to observe.

Government Pay Raises Are in the Works

◆ ADMINISTRATION is pushing a last-minute drive to win pay raises for its top officials before Congress adjourns until 1957.

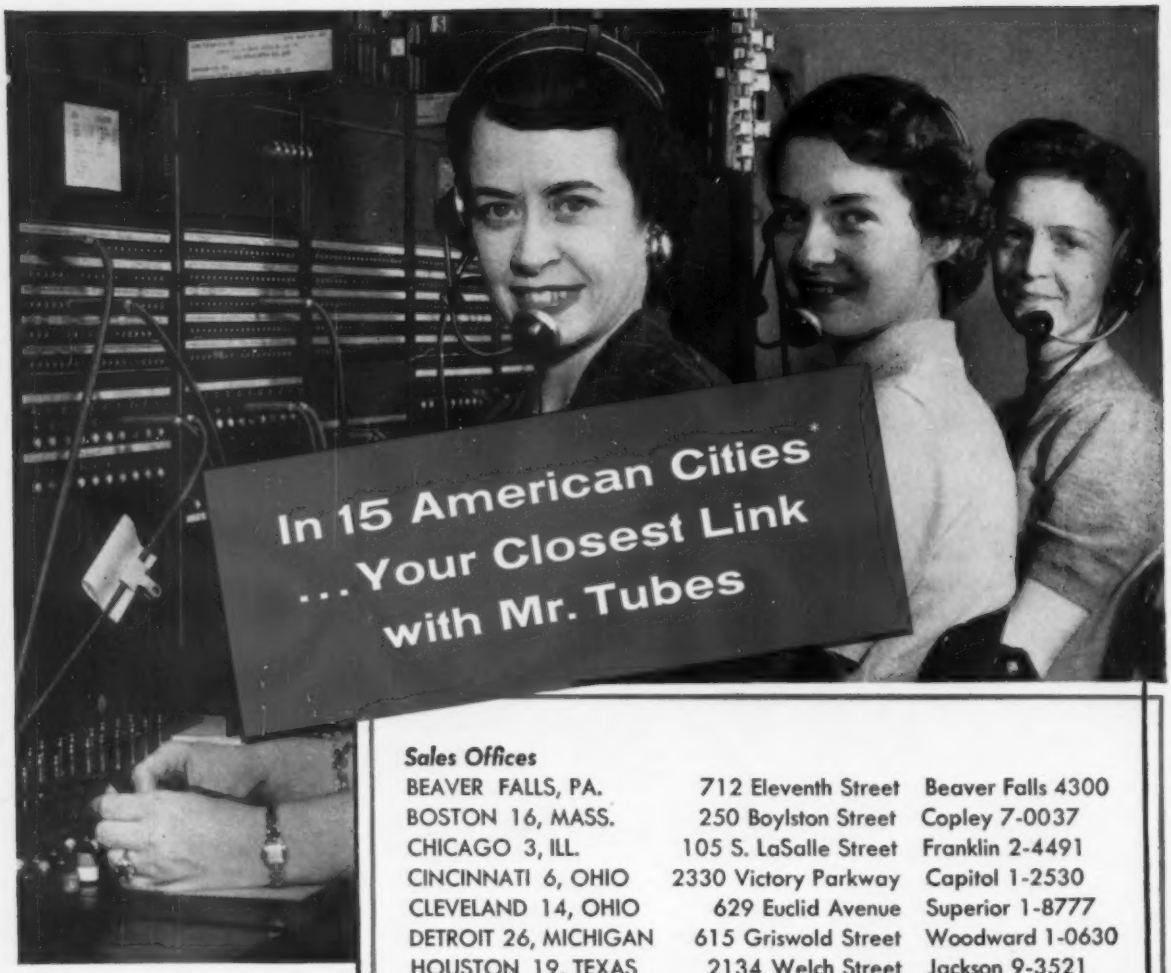
Early this year, the White House reminded Congress that salaries for the top layer of executive positions were still at 1949 levels, whereas Congress within the past year has boosted salaries for itself, for judges, and for military personnel. It was disclosed that Ike is forced to "look for fellows with private incomes" to take government jobs because of the existing salaries. The Civil Service Commission, which has been carrying the ball for Mr. Eisenhower in this matter of pay increases, is telling Congress:

"It is not reasonable to assume that the federal government can long continue to recruit competent people to shoulder these responsibilities, no matter how patriotic they may be, if we require unreasonable personal sacrifices on their part."

The proposal has fairly solid bipartisan support in Congress, because each side believes it is going to put its own people in these high-ranking jobs (most are White House appointments) come next January.

Here's what being asked:

	What They Get Now	What They'd Like To Get
Secretaries (Cabinet)	$22,500	$25,000
Under Secretaries	$17,500	$21,000
Assistant Secretaries	$15,000	$20,000
Chairmen of Boards and Commissions	$15,000	$20,500
Members of Boards and Commissions	$15,000	$20,000



Sales Offices		
BEAVER FALLS, PA.	712 Eleventh Street	Beaver Falls 4300
BOSTON 16, MASS.	250 Boylston Street	Copley 7-0037
CHICAGO 3, ILL.	105 S. LaSalle Street	Franklin 2-4491
CINCINNATI 6, OHIO	2330 Victory Parkway	Capitol 1-2530
CLEVELAND 14, OHIO	629 Euclid Avenue	Superior 1-8777
DETROIT 26, MICHIGAN	615 Griswold Street	Woodward 1-0630
HOUSTON 19, TEXAS	2134 Welch Street	Jackson 9-3521
LOS ANGELES 17, CAL.	1111 Wilshire Blvd.	Madison 5-1575
MILWAUKEE 15, WIS.	2430 S. 28th Street	Mitchell 5-4530
NEW YORK 16, N. Y.	22 East 40th Street	Murray Hill 9-6212
PHILADELPHIA 2, PA.	111 S. 15th Street	Locust 4-0322
ST. LOUIS 8, MO.	3615 Olive Street	Jefferson 5-7150
SAN FRANCISCO 3, CAL.	785 Market Street	Yukon 6-3911
SYRACUSE 2, N. Y.	205 Harrison Street	Syracuse 74-2435
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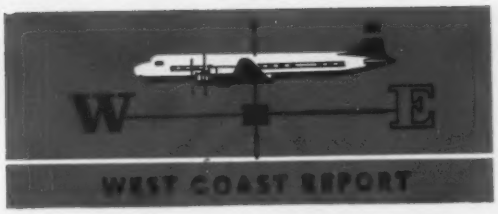


More Steel, Mill Products Headed West

Colorado Fuel & Iron to boost capacity at Pueblo Works by about 180,000 tons, 25 pct . . . New mill products include smaller sizes of oil country seamless tube and concrete wire—By R. R. Kay.

◆ MORE STEEL, more mill products, and greater variety. That is what Rocky Mountain and Farwestern steel consumers can expect from Colorado Fuel & Iron Corp.'s Pueblo, Colo. Works later this year.

Current multi-million dollar expansion program is expected to increase ingot production by about 25 pct or about 180,000 additional tons annually. Appropriate increases will be made in finishing facilities.

Project includes construction of a new openhearth, two new soaking pits in the 40-in. mill, construction of a stretch mill in the seamless tube mill expected to double the capacity for production of smaller oil country sizes.

Additions will also be made to the rod mill for manufacture of smaller sizes of concrete wire. Inclusion of this in the overall expansion project resulted from larger, new markets in local road building and construction projects.

When the program is completed, the Pueblo plant's employment will hit a record high of about 9000.

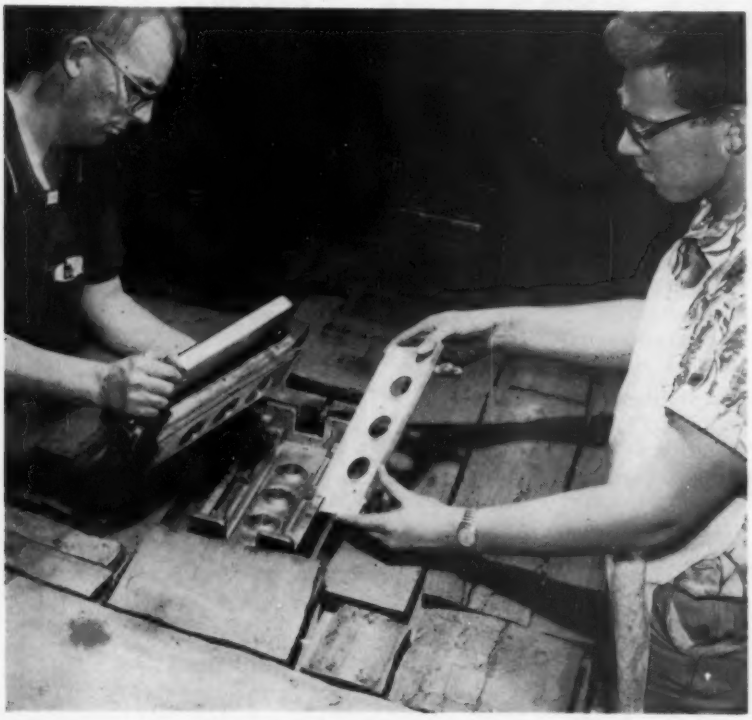
First For West

Construction has commenced on what will be the West Coast's first oxygen converter plant. Facility is being constructed at the Fontana, Calif., works of Kaiser Steel Co.

Kaiser Engineers, Oakland, Calif., which holds exclusive U. S. rights to the steelmaking process, granted formal approval earlier this month.

Installation of the oxygen converter is part of Kaiser's $113 million expansion program.

Compression Forming: Look at Lockheed



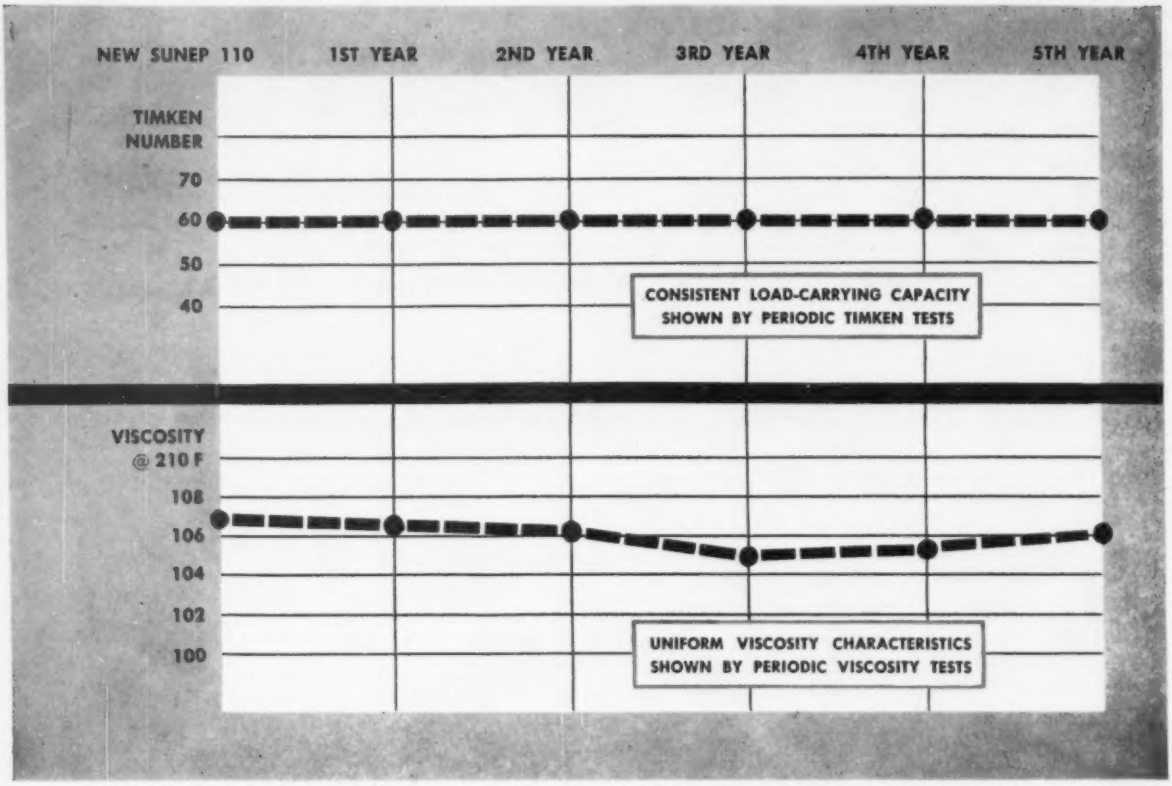
◆ LOCKHEED Aircraft Corp., Burbank, Calif., announces development of a precision technique for shaping metal parts to extremely fine tolerances.

Compression forming, according to Lockheed engineers, will save metal and manhours by turning out pieces accurate to almost a plus or minus zero.

Method uses a standard rubber hydropress. Preforming to broad tolerances at about 1000 psi is necessary. Parts are made malleable, then inserted into the compression dies.

Lockheed reports that when force on the dies is released, the elastic qualities in the metal will cause it to recover a predictable amount. Springback, normally a nuisance in bending, can be reduced and controlled.

Company believes that proper programing and handling will eliminate any need for finishing.



Taken from the records of a major steel producer, the above graphs show the life record of a Sunep gear lubricant used in a 3-stand, 4-high cold-rolling mill. *With no make-up,* Sunep is as good as new after running more than 30,000 hours.

Steel company tests show:

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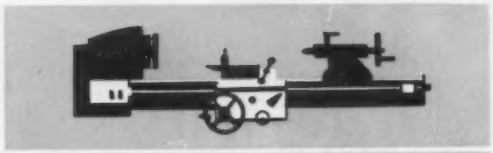

MACHINE TOOL HIGH SPOTS

What's Holding Up Turbine Gear Program?

Many obstacles in way of $40 million program for propulsion gear tools . . . Although GSA has approval to proceed, more details stand in the way . . . Machine tool reserve now the problem—By *E. J. Egan, Jr.*

◆ JUST A LITTLE over a month ago, the Senate Small Business Committee reported on a variety of shortcomings it perceived in the Government's machine tool preparedness program (THE IRON AGE, June 21, p. 66). One area of criticism in the lengthy report centered on the so-called turbine and turbine gear program.

Propulsive units of modern ships must be produced on special machine tools. The turbine and turbine gear program was supposed to provide a reserve of this equipment for defense needs. Office of Defense Mobilization surveyed the situation months ago, found that $70 millions' worth ought to do the trick.

Budget Delays . . . Bureau of the Budget questioned the dollar total, asked an interagency study group to check the cost figures again. This took more months of valuable time, finally resulted in a $40 million figure that was approved. All that was needed was a little procurement action.

In its report, the Senate committee noted a "general reluctance to commit funds for machine tools." Report also said, "If greater determination is not shown, the next emergency may have come and passed without the vital decisions having been made."

The Committee's needle for the turbine and turbine gear question seemed to touch a tender spot. Just four days after the Senate report was issued, General Services Administration announced it had approval to "proceed."

Next Step . . . But that doesn't mean that any purchase orders have been signed. Not yet. First, GSA must contract with the turbine and gear manufacturers to act as the Government's contracting agents in buying the tools and related equipment needed.

So far, so good. The firms who would be expected to use the machines ought to know what they'd need in an emergency. The list adds up to boring bars and mills, broaches, drilling machines, gear cutting and finishing machines, grinders, lathes, milling machines and some miscellaneous items.

Shouldn't be too hard to get some of these items knocked off the list and onto builders' order books. But it's not that easy. The people who propose to use the tools and the people who propose to build them must hold who knows how many conferences to settle on "final specifications."

"Aw come on Harry, you've got to take the boy's kidding in the nasty spirit that it's meant!"

False Start . . . Once these details have been agreed on, they must then be resolved between GSA and its turbine gear contractor-agents. This might take a little time, in view of past experiences. But then, the go ahead? Can the tools really be ordered?

Well—not quite. According to the GSA, "existing Government inventories will first be surveyed and any suitable items available from Government reserve stocks will be allocated to that program. A quick run-through of some punched cards ought to turn up the right answers, wouldn't you think?

Inventory Problems . . . Only trouble is, the Government's inventory of the machine tools it owns is far from complete; about half done by some estimates, two-thirds finished by more optimistic predictions. All someone has to say is, "better hold this up until the inventory is all done. No sense ordering a machine if a few months (or years?) of checking shows that we have one something like it."

All of which goes to show that Government "proceedings" usually take a long, long time. It will be interesting to see just when the $40 million turbine-gear-tool program gets tacked onto builders' backlogs.

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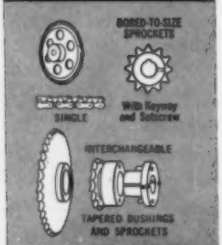

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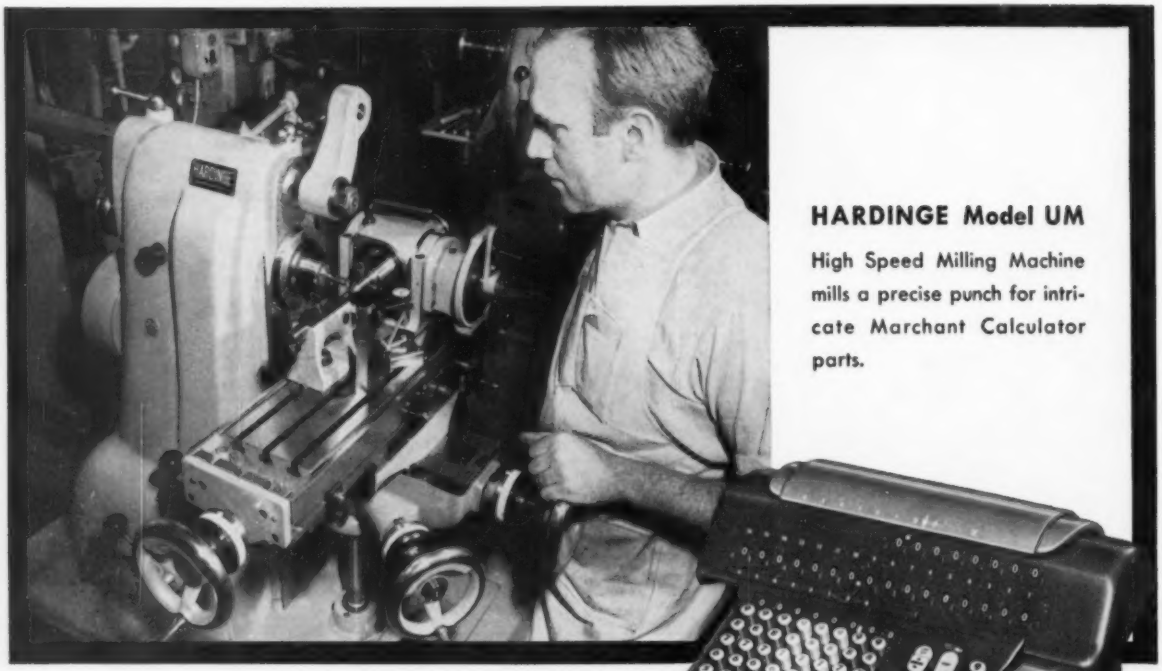

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The Iron Age

SALUTES

Daniel L. Lombard **From office boy to president of his own firm, metalworking, the U. S. Government and Youngstown, O., are indebted to his engineering skill. The depression of the 1930's caused him to make a big decision.**

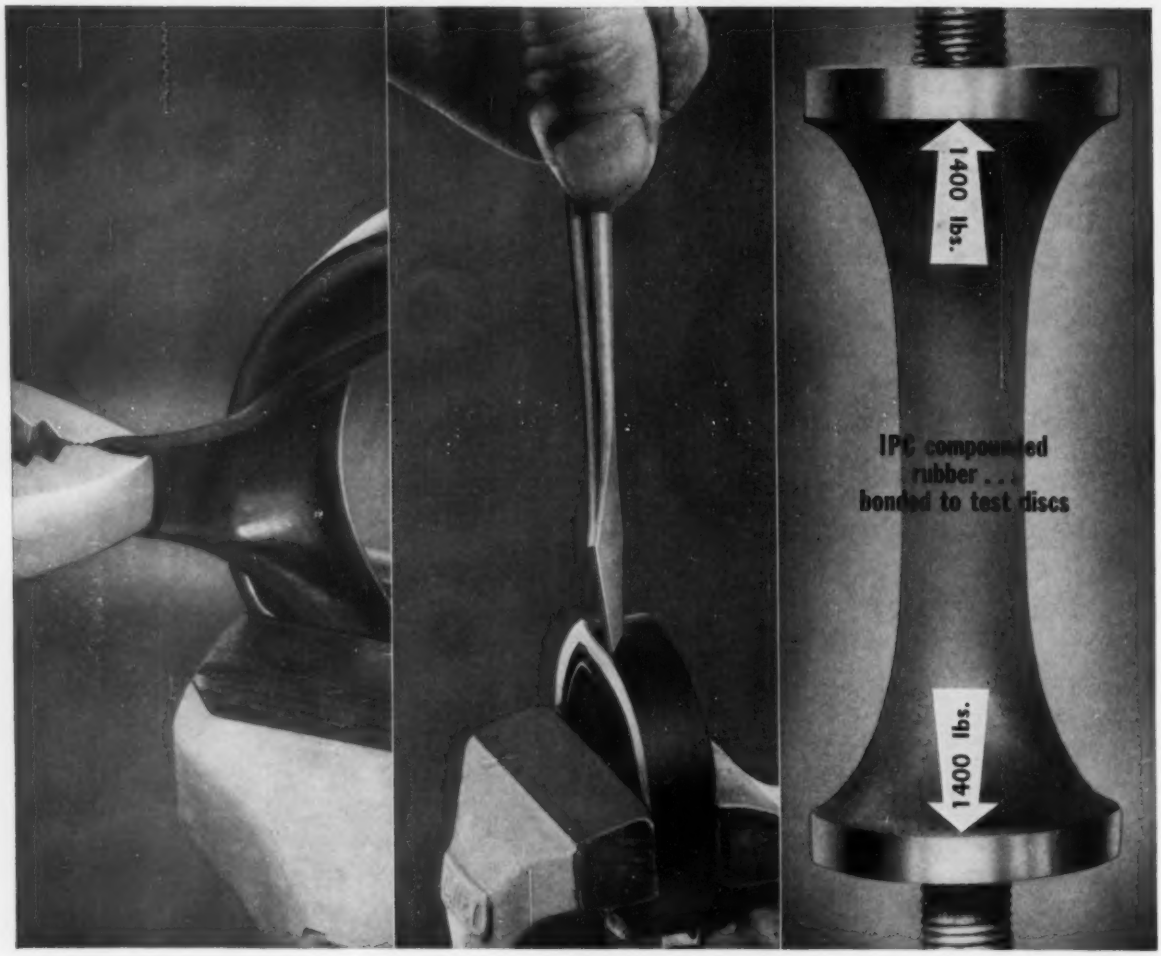
The din of a steel mill can hardly be called melodic, but one played a tune that lured Daniel L. Lombard, a striving young musician, away from his etudes and instruments for good. The year was 1932, when musicians had a rather difficult time making ends meet. Possessor of a practical mind, Dan Lombard changed his vocational objective, landed a job as office boy with Truscon Steel Co. and enrolled in a correspondence school engineering course. It was the start of a career that gave Youngstown, O., its first extrusion machinery industry.

While turning his creative efforts from smoothing out musical scores to the art of making steel, Dan Lombard worked his way up in Truscon. By the time he got his correspondence school diploma, he was employed as a checker in the company's engineering department. Later, he was presented an honorary degree of Doctor of Science by Bloomfield College and Seminary for his design promotion and scientific achievement.

Mr. Lombard soon found his engineering ability to be in great demand and for a few years he served in business and government as an engineering specialist. The experience of dealing with people on a high level developed in him an acumen that needed only seasoning. He was ready for bigger things. When his big chance came, he proved equal to the task.

In 1946 he organized Lombard Corp., and the firm has since earned for itself an international reputation as a manufacturer of extrusion machinery.

Like many another man whose formative years were enmeshed in the depression, Dan Lombard's success is in no small part due to his seemingly infinite capacity for hard work. It is due, also, to his personality which is characterized by a contagious smile, a sympathetic ear and an aura of inner-quietness that puts those in his presence immediately at ease. A family man, he has for his avocations airplanes, horses and—you might have guessed it—music.



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8. Bonded Case Seal Limited Contact Lip
9. Bonded Case Seal Straight Lip With Garter Spring
10. Bonded Case Seal Limited Contact Lip With Garter Spring
11. Bonded Case Seal Straight Lip Thin Rind Type
12. Bonded Case Seal Limited Contact Lip Thin Rind Type
13. Rubber Covered Bonded Case Seal Straight Lip
14. Rubber Covered Bonded Case Seal Limited Contact Lip
15. Rubber Covered Bonded Case Seal Straight Lip With Garter Spring
16. Rubber Covered Bonded Case Seal Limited Contact Lip With Garter Spring

P4

The Iron Age INTRODUCES

Charles P. Whitehead, elected president, **The National Roll & Foundry Co.,** Avonmore, Pa.; **William A. Curran** and **J. Harvey Johnston,** re-elected vice presidents; **William Johnston, Jr.,** named manager, castings sales.

Kenneth R. Fisher, appointed president, **Super Tool Co.,** Detroit subsidiary of Van Norman Industries, Inc.

Leon Cherksey, named chairman of the board, **American Chemical Paint Co.,** Ambler, Pa.; **Gerald C. Romig,** elected president.

O. J. Skawden, named vice president, **Sutton Engineering Co.,** and will continue as chief engineer, Bellefonte, Pa., plant; **Ray A. Bland,** appointed sales manager, Mechanical Equipment Dept., Pittsburgh office; **William R. Heck,** named sales engineer.

S. J. Moran, elected vice president and general manager, foundry and mill machinery operations, **Blaw-Knox Co.,** Pittsburgh; **E. C. Rook,** named vice president and general manager, fabricated products operations.

Arthur R. Foreman, appointed comptroller, Steam Turbine Div., **Worthington Corp.,** Wellsville, N. Y.

Robert Allen, named consultant, machinery sales, **Crown Cork & Seal Co., Inc.,** Baltimore, Md.

J. K. Hawk, elected director and vice president, engineering, **F. J. Evans Engineering Co.,** Birmingham, Ala., office; **N. B. Buehrer,** elected executive vice president; **D. M. Mills,** elected vice president, Houston Div.; **Jack J. Tyson,** elected vice president, Atlanta Div.

Robert P. McKenrick, elected vice president, sales, **Blaw-Knox Co.'s** Construction Equipment Div., Mattoon, Pittsburgh, and Elyria; **A. J. Cox,** appointed div. manager, Mattoon plant.

R. R. Gardiner, named secretary-treasurer, **Rotary Electric Steel Co.; Mrs. E. W. Madigan,** elected asst. secretary-treasurer; **D. L. Rehberg,** named controller.

Karl H. Kostenbader, Sr., appointed superintendent, foundries, **Bethlehem Steel Co.,** Bethlehem, Pa., plant; **Jesse H. Muir,** named superintendent, steel foundry; **James C. McKerihan,** named assistant's supt.; **Amos L. Proctor,** named asst. superintendent, brass foundry; **John B. Stevens,** named asst. superintendent, iron foundry.

Lewis J. Pentland, named district sales manager, New York, Durez Plastics Div., **Hooker Electrochemical Co.,** Niagara Falls, N. Y.; **Evan E. Graham,** named district sales manager, California; **Henry B. Puff,** named district sales manager, Chicago.

GEORGE T. PFIFER, elected vice president, finance, E. W. Bliss Co., Canton, O.

DALE W. PATRICK, appointed president, Colona Div., Pittsburgh Screw and Bolt Corp., Pittsburgh.

LAWRENCE R. MILLER, named chief engineer, Trent Tube Co., East Troy, Wis.

RALPH H. SCHOLL, named manager, roll sales, The National Roll & Foundry Co., Avonmore, Pa.

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R. Tom Sawyer, named engineering consultant, **Alco Products, Inc.,** Schenectady, N. Y.

Charles E. Howard, named manager, attachments, **The Yale & Towne Manufacturing Co.,** Philadelphia.

C. L. Thompson, named material handling sales manager, Buda Div., Tractor Group., **Allis-Chalmers Mfg. Co.,** Milwaukee; **D. Kuethe,** named asst. material handling sales manager.

Gilbert N. Peterson, appointed asst. plant manager, Buffington, Ind., plant, **Universal Atlas Cement Co.,** N. Y.

Garrett B. LeVan, appointed manager, rod and bar operations, **Mallory-Sharon Titanium Corp.,** Niles, O.

David Birger Orden, named Latin-American representative, Mexico City, **Metal & Thermit Corp.,** N. Y.

R. A. Aeberly, appointed Los Angeles district manager, **Electro Metallurgical Co.,** Div. of Union Carbide and Carbon Corp.; **Robert M. Fowler** and **Hendrik de Wet Erasmus,** appointed research consultants, Metals Research Laboratories, Niagara Falls, N. Y.

Roy W. Benedict, appointed Northwest district sales manager, **Clemson Bros., Inc.,** Portland, Ore.

Maynard W. Johnson, appointed general manager, Large Motor and Generator Dept., **General Electric Co.,** Schenectady, N. Y.

Bernhard W. Weber, named manager, manufacturing, **Metal & Thermit Corp.; H. Alfred Rack,** named production manager.

Donald W. Oakley, named technical adviser to the president, **Metal & Thermit Corp.; A. James Fisher,** named general sales manager.

J. E. WILLLIAMS, appointed vice president and general manager, Western Brass Mills, Div., Olin Mathieson Chemical Corp., East Alton, Ill.

FRANCIS H. GIBSON, elected vice president, sales, South Chester Tube Co., Chester, Pa.

WILLIAM WILSON, named director, research and development, A. Finkl & Sons Co., Chicago.

ROBERT L. STOCKUS, appointed manager, rolling mill sales, Rolling Mill Div. Farrel-Birmingham Co., Inc., Ansonia, Conn.

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Forge-Die — 14% Tungsten Hot Work Steel, having high resistance to softening at elevated temperatures. Recommended for piercers, punches, and hot forming dies.

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WCC — New, very deep hardening tungsten, chromium, cobalt and vanadium steel—outperforming 9.50 tungsten types. High resistance to wear and thermal fatigue. Use for hot extrusion dies, permanent molds for brass casting, forging die inserts, hot-press dies.

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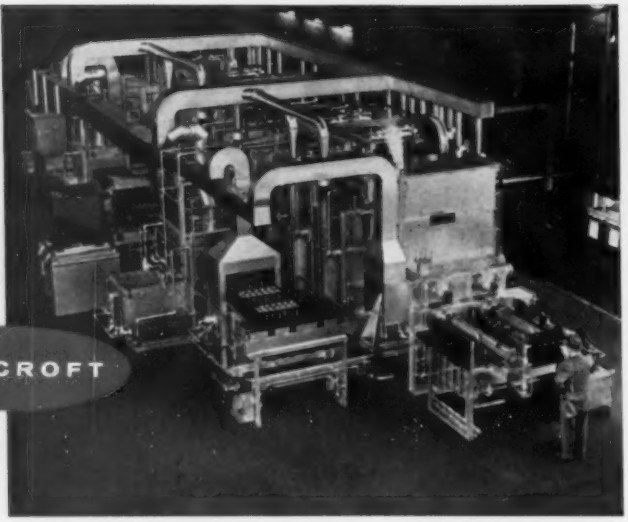
BLAZING THE HEAT TREAT TRAIL— WITH HOLCROFT



LET'S TALK

CONTROLLED ATMOSPHERES

Holcroft has pegged many of its research activities to the problems of controlled atmosphere heat treating. As a result, Holcroft has blazed the trail for industry.

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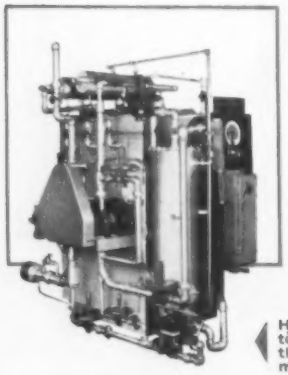
Basic gas generator patents go back to 1883. However, the first real use and understanding of fundamental equilibrium constants—now in general use in all gas atmosphere work—was by Holcroft in 1934. Dew point cups and equilibrium curves were furnished customers at that time. Today, Holcroft's new Lo-Dew generator (750, 1200 and 2400 cfh) provides *rated capacities* at low dew points.

Advances like these are typical of the scope of Holcroft activities—proof that you can get right answers without prejudice. Insist upon a Holcroft quotation as your first step when you have a heat treat problem. *You'll save!*



Holcroft's new gas generator designed to produce gas atmospheres between the limits of perfect combustion and modified "302".

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CANADA: Walker Metal Products, Ltd., Windsor, Ontario

PERSONNEL

John E. Stukel, named metallurgical sales engineer, Cleveland, **The Cleveland-Cliffe Iron Co.**

James G. Webber, appointed district representative, **Leece-Neville Co.,** Cleveland.

Paul C. Mortenson, named chief engineer, ground mobile products, **Vickers, Inc.,** Detroit; **Frank L. Moncher,** named chief engineer, airborne products; **Les Haisen,** named manager, industrial products, West Michigan branch.

Following appointments are within the Axle Div., **Clark Equipment Co.,** Buchanan, Mich. **L. M. Gray,** named chief engineer; **G. C. Vanderberg,** named engineering consultant; **William E. White,** named new development engineer.

Karl A. Krantz, named purchasing agent, **The Cleveland Worm & Gear Co.** and **The Farval Corp.,** Cleveland.

Irwin W. Best, Jr., named sales representative, Seattle district, **Allis-Chalmers Industries Group; Rudolf Krosche,** named sales representative, Akron, Ohio.

Harry F. Barr, named chief engineer, Chevrolet Motor Div., **GMC,** Detroit.

Joseph V. Stout, named ceramic engineer, **Metal & Thermit Corp.,** Carteret, N. J.

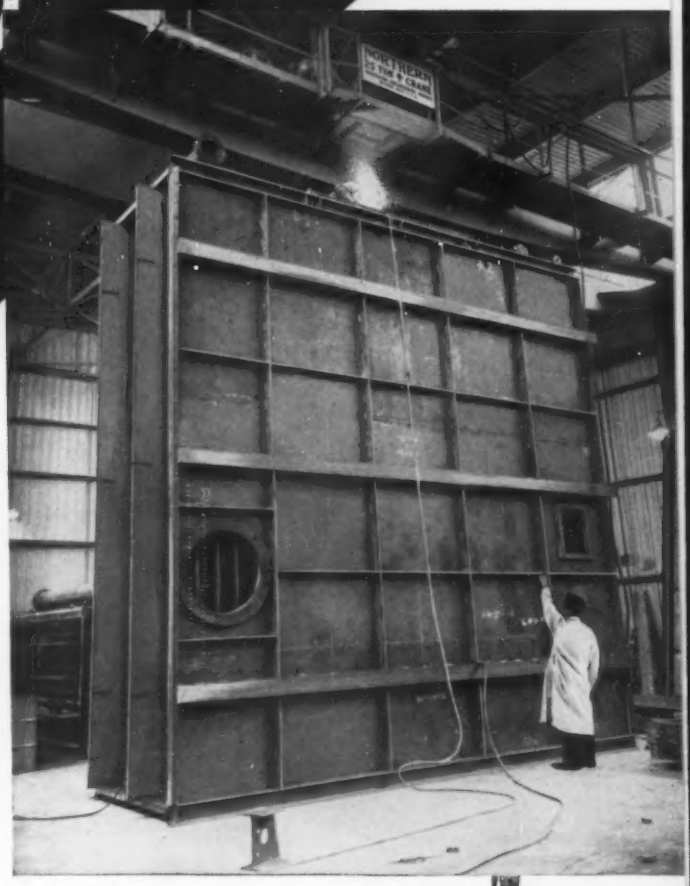
Robert B. Winder, named sales engineer, Detroit office, Steel and Tube Div., **The Timken Roller Bearing Co.**

Raymond J. Brown, appointed West Coast field representative, **Copper & Brass Research Assn.,** Los Angeles, Calif.

R. H. Gillespie, named fleet sales manager, **GMC Truck and Coach Div.,** Pontiac, Mich.

William A. Anthony, named to head engineering and sales, continuous mixers, **The Gas Machinery Co.,** Cleveland; **Hjalmar A. Anderson,** named sales engineer, Industrial Furnace Div.

Two Miles of Pipe in this FORTY-TON PACKAGE

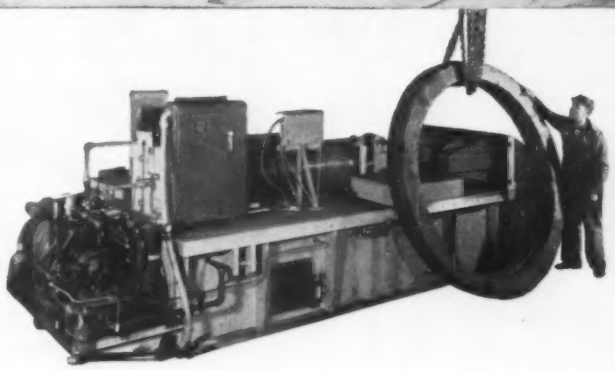


Completely Assembled, Welded and Tested by McGREGOR-MICHIGAN

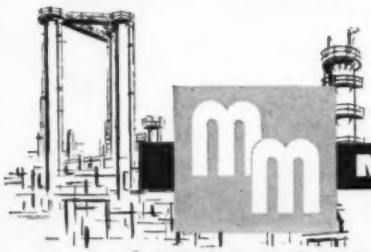
Sorry, we can't show the contents of this hefty box. It's our customer's design. But we *can* tell you each of four assemblies required approximately 10,000 lineal feet of 2" extra heavy pipe, hydrostatically tested at 600 psi pressure. Shipment was made the McGregor-Michigan way—*on schedule*. This is one of the first sizeable jobs produced in our new Heavy Fabrication Plant which is equipped with the most modern equipment for bulkier and heavier work. Our Main Plant continues to turn out welded and riveted plate fabrications in both mild and alloy steels, such as steel mill charging buckets, ladles, furnace doors, ingot cars—chemical and petroleum processing towers, tanks, jacketed kettles—machine bases, diesel engine beds, heat exchangers, autoclaves, stacks—and an endless variety of other industrial equipment.

Something different in fabrication service is illustrated. It's our new six hundred ton horizontal press for cold-forming heavy bars, channels, conveyor rails and other structural steel members. The 67" I.D. gear blanks shown are SAE 6150 steel, of 6" x 6" cross section, formed and then welded into an accurate ring. After welding, joints are cobalt-bomb x-rayed. Such equipment permits us to offer you close tolerance forming to almost any configuration with no heating or reheating (depending on nature of material), simplified dies, faster service and lower costs.

Please send prints or specifications for prompt quotation on your next fabrication job, or write for brochure illustrating our facilities and production.



New 600-ton "Bulldozer" — M-M designed and built horizontal forming press.



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STEEL PLATE FABRICATING AND WAREHOUSING

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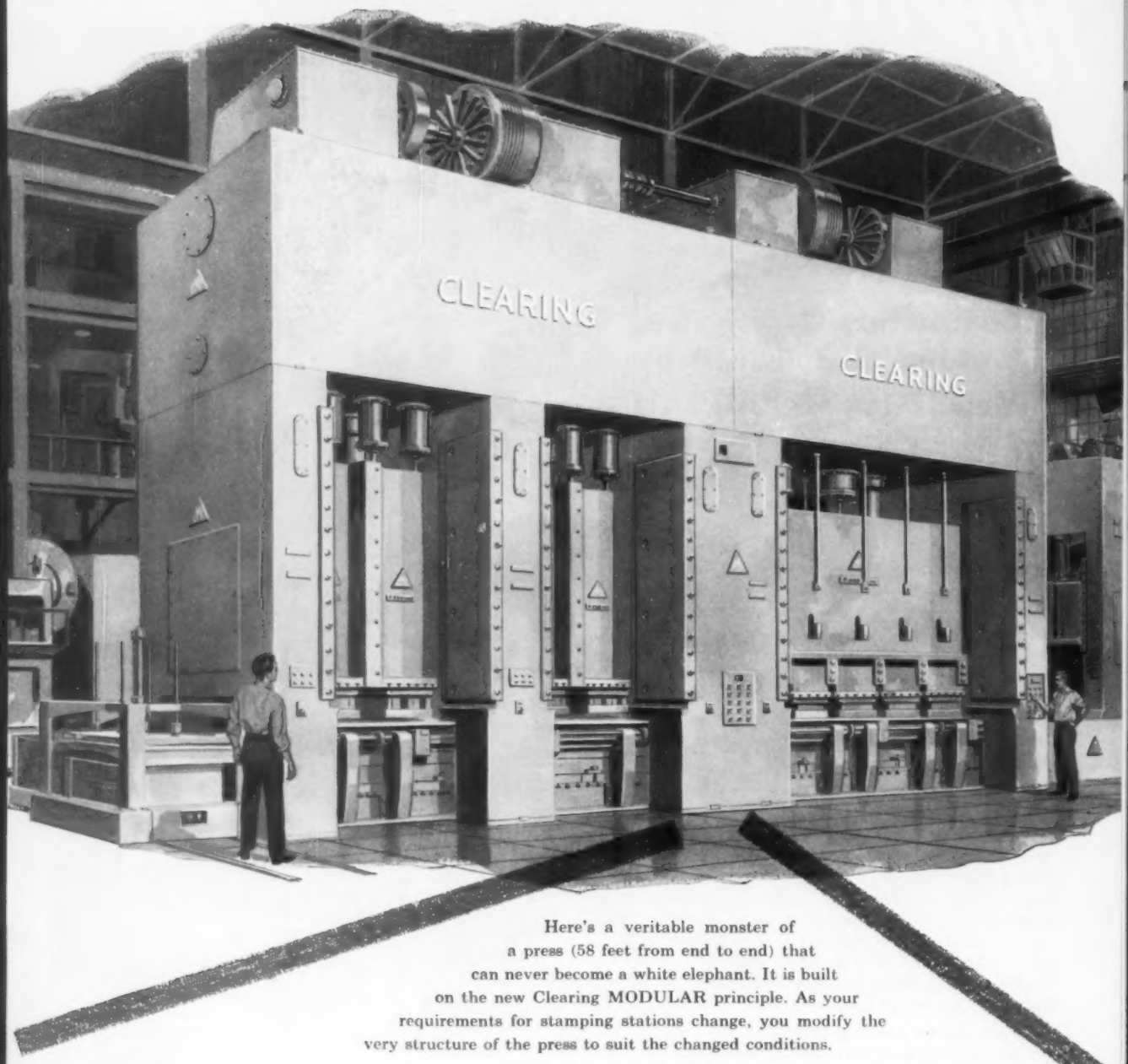
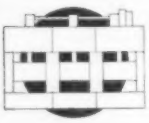


Here's a veritable monster of a press (58 feet from end to end) that can never become a white elephant. It is built on the new Clearing MODULAR principle. As your requirements for stamping stations change, you modify the very structure of the press to suit the changed conditions.



MODULAR CONSTRUCTION

Two Drives

Two Beds

Two Crowns

Common Uprights
(Serve both crowns and beds)

SPLIT SLIDES

make instant die changes possible

MULTIPLE SLIDES

provide for differential loading

Transflex Feed Mechanism for automatic feeding—hands-off production

SUB-SLIDES

for individual die adjustment and die changes

MODULAR Presses

the TRANSFLEX equipment you can modify for major production changes

Modular press construction is a Clearing innovation that makes it entirely practical to automate the production of large scale parts without fear that future changes in models will render the press equipment obsolescent. The illustration at left shows a Transflex press designed for the General Electric Company to produce two similar parts alternately—without requiring an actual die change.

In order to obtain the most ideal production set up, a number of Transflex principles were applied . . . multiple slides, split slides, the versatile Transflex feed mechanism . . . and a giant press 58 feet in length began to take shape. By turning to modular construction a complex press of this size became practical. Two crowns are used with two separate drives mechanically interlocked. There are five slides, four uprights, and two beds. All of these parts add up to one automatic machine designed for today's type of production. However, if future model changes radically alter the number of operations required or the tonnage characteristics of the series, the investment in automation equipment will not have become obsolete. Modular frame elements can be added to or subtracted from the structure and the versatile transflex feed mechanism can be lengthened or shortened to recreate an automatic press which will meet tomorrow's production needs.

The Modular Principle

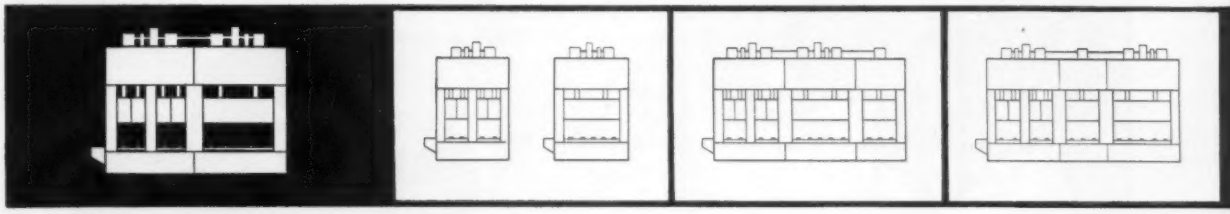
Here is how Clearing modular construction overcomes the historic drawback which heretofore would have made equipment of this nature impractical.

1956 A schematic drawing of the press as it was designed for the General Electric Company to produce washing machine and dryer covers in a dual tooling set up.

195? As requirements change the modular press can be converted to two separate presses, or . . .

additional modular units may be added to one end of the machine to increase the number of available stations, or . . .

additional modular units may be placed in the center to alter the sequence of tonnage capacities, etc.



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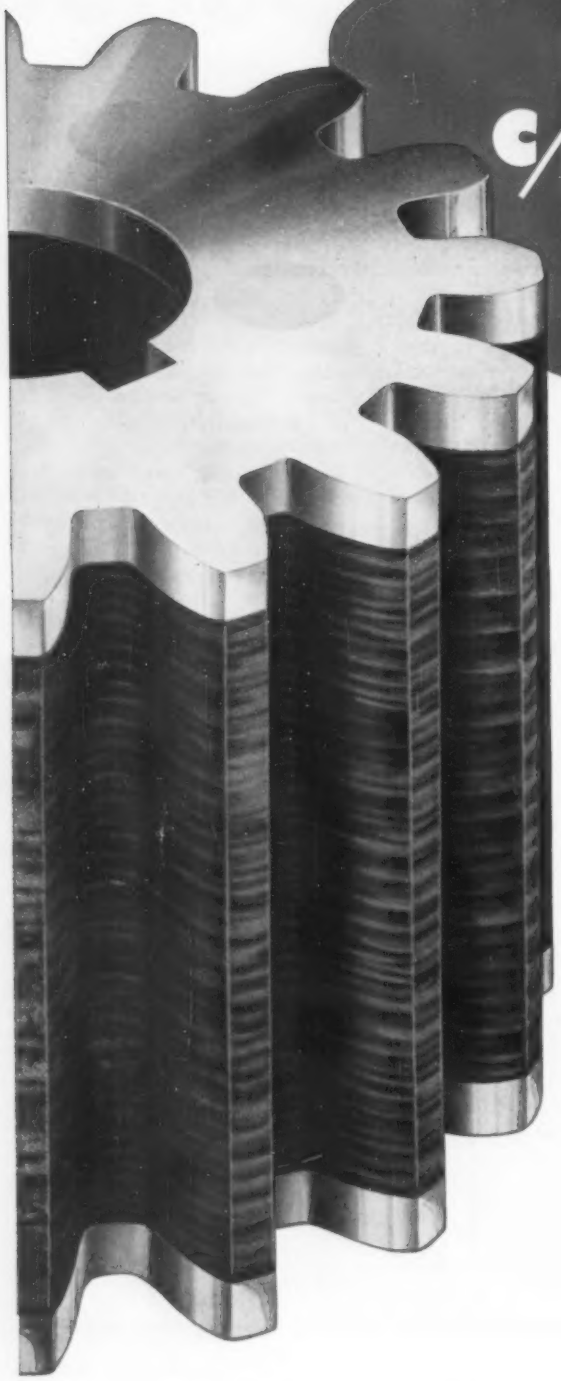


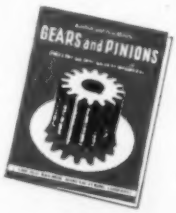
Do you know what C/R RAWHIDE GEARS can do for you?

HERE'S WHAT—They will transmit power quieter, with less vibration than other types of gears. These tough, resilient Rawhide gears will absorb momentary overloads up to 3 times their rated H.P. capacity . . . protecting expensive metal gears. Since C/R Rawhide pinions cause negligible wear, they actually prolong the life of mating metal gears.

MORE FACTS—They require no lubricant, are nonconductors, and are extremely durable. Rawhide spur gears are cut in sizes from 1″ O.D., ¾″ face up to 30″ O.D., 12″ face. D.P.'s range from 48″ to 1¼″; horsepower ratings go up to 50 H.P. or more. Where high temperature and humidity are factors, C/R gears cut from Nylon, Fabroil, Bakelite, or Micarta may be more suitable.

ASK C/R—We've been cutting non-metallic spur, helical and bevel gears for all types of applications for over 74 years. May we help solve your gear problem?

Please write for illustrated C/R Gear Booklet.



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FEATURE ARTICLES

Better carburizing quality—

Reduce Gear Distortion With Mass Marquenching

◆ A new carburizing and heat treating installation combines maximum part quality with a minimum of distortion . . . Carburizing is achieved in a closely controlled gas atmosphere to provide optimum carbon gradient.

◆ Mass marquenching produces distortion-free gears with improved toughness and wear resistance . . . But the cost aspects are equally important . . . Elimination of press and plug quenching greatly reduces part handling, adds significantly to cost reduction.

By E. A. SCHOEFER,
Executive Vice President,
Alloy Casting Institute,
Mineola, N. Y.

◆ HOW DO YOU go about making a carburizing and general heat treating setup simple and more efficient?

It's a question that is likely to have a number of correct answers. But a significant approach to a satisfactory answer is to be found in a million-dollar program for the modernization of heat treating facilities at the Fort Wayne Works of the International Harvester Co.

This same installation is also responsible for the development of a new "mass marquenching" technique that should prove valuable to scores of heat treaters of critical steel parts.

Consisting of five gas furnaces, the new setup for carburizing and heat treating truck gears, king pins, and shafts is a major switch from previous techniques. These—although they appeared to be simple—were found to be both ex-

Transmission shafts, formerly plug quenched, are fixtured to enter marquenching bath.

Transmission gears are loaded on high alloy trays before feeding to carburizing furnace.

pensive and inefficient. For one, almost every part processed had to be straightened after heat treating.

Another expensive item involved the individual quenching of parts—followed by the problem of retrieving them from the oil quenching medium. Despite the fact that these methods were costly and required a lot of hand labor, the properties of the products obtained were not consistently high grade.

The conventional warm oil quench (90-100°F.) hardened the parts from the outer surfaces inward. This resulted in the creation of high internal stresses. It was these stresses that caused distortion of the parts and necessitated the subsequent straightening operations.

With the new marquenching method, hardening takes effect from the inside, or core, to the outer surfaces of the part. This method of hardening is ideal for such heavily loaded parts as truck gears. It permits transformation of austenite to martensite in "easy" stages by means of an interrupted quench. Quenching oil temperature is held at about 400°F.

The work enters the quenching bath at a temperature slightly above the M_s point of the carburized case. It is held in the bath until all parts acquire a uniform temperature throughout their mass. Parts are then air-cooled to room temperature.

Transformation to martensite occurs during the relatively slow air-cooling. Since the temperature gradient characteristic of conventional quenching is absent, the stresses set up by transformation are much lower. As a result there is considerably less likelihood of distortion or quench cracking.

The modernized heat treating facilities at the Fort Wayne Works consist of a battery of five radiant-tube gas carburizers. Supplied by Surface Combustion Corp., these furnaces are used in connection with the marquenching of the truck gears. All furnaces are of the continuous type and have two rows each, accommodating 21 trays per row, on which the work is automatically charged to the furnace.

Furnace atmosphere consists of a mixture of RX gas as the carrier and natural gas as the activator, in a ratio of 1250/35 cu ft.

Controls case depth

The furnaces are operated in different cycles, depending upon the carburized case depth desired. Three case depth ranges have been standardized: 0.025-0.035 in., 0.031-0.047 in., and 0.047-0.063 in. The close control of atmosphere obtained results in the production of a carburized case with optimum carbon concentration. This provides better load-carrying and wearing characteristics.

Previous carburizing methods usually produced a surface carbon content in the range of 1.10-1.20 pct. The major disadvantage of so

high a carbon content is the retention of austenite after hardening. To minimize this tendency, atmosphere in the new furnaces is controlled to produce surface carbon contents of 0.85 to 0.95 pct.

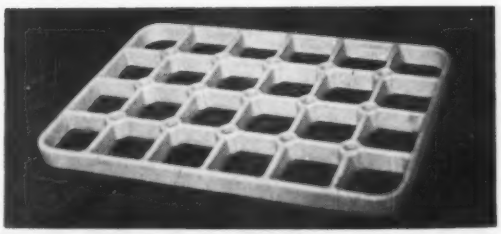
The quenching operation is accomplished in a 1600 gal tank of special design, located at the side discharge door of each furnace. The work is discharged onto an elevator which, in turn, is submerged in the 400°F oil. Tank design provides the greatest flow of oil at the submerged level. The quench tank is hooded so that all parts may be quenched under protective atmosphere.

The combination of careful atmosphere control and marquenching is consistently producing a fine martensitic case structure on all gears. Typical of the carburizing grades used is SAE 4820. Hardness results obtained indicate R_c 60 or higher on the surface of gear teeth. Core hardnesses are R_c 43 at the pitch line and R_c 38 at the root line.

Service life extended

Because residual stresses have been minimized, service life has been increased by as much as 200 pct. Load-carrying capacity has jumped as much as 20 pct. Since distortion is no longer a problem, press and plug quenching have been eliminated. Now all gears are batch quenched and still hold tolerances within the desired limits.

A great deal of the success of the new carburizing and marquenching treatments is due to extensive use of specially designed high alloy trays and furnace parts. These are capable of withstanding the severe conditions of temperature, atmosphere, and thermal shock. Trays of a lightweight but rigid design are used to support gears in the carburizing furnaces. Such trays are made of cast Type HT alloy, containing 35 pct nickel and 15 pct chromium.



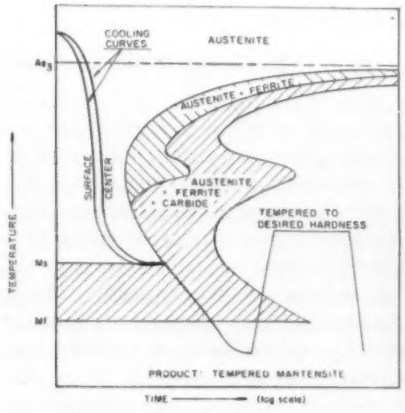
Cast HT alloy trays are lightweight but rugged. Alloy resists carburizing, severe thermal shock.

The trays are not only able to stand up for long periods of time in a carburizing atmosphere, they are also capable of continuous operation in temperatures ranging from 1650 to 1700°F. Most important from the standpoint of tray life, these trays can withstand the shock of repeated heating and cooling cycles.

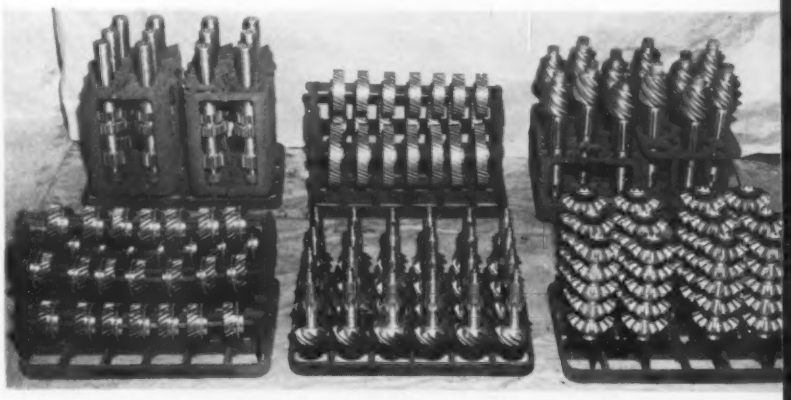
Loading fixtures on which gears are placed prior to the carburizing operation are also made of cast HT alloy. These special fixtures enable the gears to be loaded in a horizontal plane. This is an advantage in obtaining uniform properties.

A number of functional parts of the carburizing furnaces make good use of the special properties of the HT alloy. Most important are the radiant tubes used to heat the furnace, and such accessories as hearth plates, rails, bracket keys, and tube supports.

Prime advantage in using the HT alloy stems from its excellent resistance to gas carburization. Some of this resistance is due to a fairly high silicon content. Although not required in the carburizing cycle, this alloy can operate satisfactorily in reducing atmospheres up to 2000°F and in oxidizing atmospheres up to 2100°F. Wholly austenitic, this alloy is notable for its excellent hot strength in the cast form.



Schematic diagram illustrates typical cooling curves in austenite to martensite transformation.



Typical loading arrangements of gears and shafts on fixtures with fixtures located on trays.

Sizes itself automatically—

New Tool Hones Bores To Close Tolerances

◆Accuracy for roundness and straightness, low tool breakage rate, minimum machine downtime and faster production . . . These are some advantages of a new honing tool put to work on Chrysler's production lines.

◆ Removal of 0.003 in. of metal takes 20 to 25 seconds . . . Sizing is fully automatic . . . One tool hones all bores in a cylinder bank on a line handling 34 engine blocks per hour . . . Bore tolerances stay within 0.0005 to 0.0007 in.

By W. G. PATTON, Engineering Editor

HONING TOOL has six stones, each mounted to expose its entire cutting face and allow coolant to reach all areas being honed.

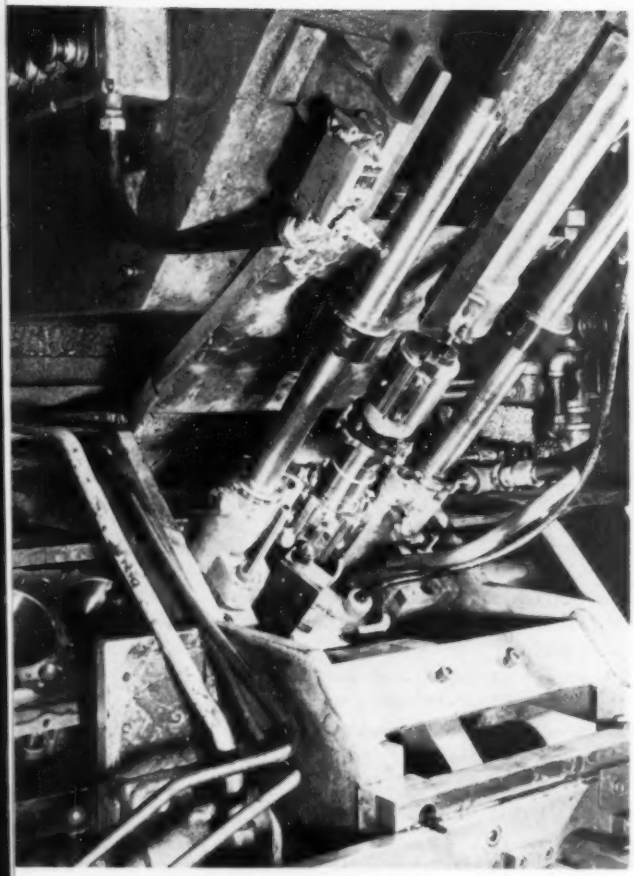
◆ HONING cylinder bores with a new double cone-type tool attached to a rigid drive shaft enables Chrysler Div., Jefferson-Detroit plant, to hold cylinder bores within the desired limit of 0.0005 to 0.0007 in. for roundness and straightness.

A fully automatic mechanical sizing device entirely eliminates the need for an electronic control system. The sizing gage has a controlled float and sufficient lead for any normal misalignment. Tool life has been extended and tool breakage reduced.

Eliminates fitting problems

Ability to hold the accuracy of its cylinder bores consistently within very narrow and predictable limits greatly simplifies the problem of selective fitting of pistons. Pistons are machined to suit bore sizes as honed in the cylinder block department. Fitting of pistons to bores has been discontinued.

Other advantages resulting from the use of the new-type honing tools include: (1) reduced honing machine downtime and longer stone life, (2) no oversize and undersize bores, (3) decreased tool breakage, (4) less frequent replacement of tool guides and gages, (5) faster production.



NEW TOOL is about ready to enter cylinder bore. The gage prevents it from entering fully until bore is honed to near-correct size.

Jes-Cal Co., East Detroit, Mich., designed and made the tools for honing blocks to final size in a single operation.

Operating at 80 pct efficiency, two lines have a capacity of 34 blocks per hour per line. The same tool hones all bores in a cylinder bank. Single tools operate simultaneously, one on each side of the block.

It takes 20 to 25 seconds to remove about 0.003 in. of metal. Final bore sizes are held consistently within 0.0005 in. for any of five specified ranges.

Holding the honed surface finish in the range of 25 to 35 microinches assures optimum engine life and performance. Maximum permissible taper, measured at the top of the bore, is 0.001 in. A mixture of kerosene and a soluble oil is used as a honing lubricant.

There's no need for universal joints on the honing tools. Numerous developments by Jes-Cal engineers made this possible. Fixturing is much more accurate now than previously. Also, use of precision spindles on machine tools lends greater accuracy to boring operations. Thus, the need for off-center compensation in honing tools has been reduced. The new honing tools take advantage of this improved machining accuracy.

Other advantages result from making the honing tool an extension of the machine spindle. These include: (1) more uniform application of machine power and abrading pressure, (2) use of larger ranges of rotation and faster reciprocating speeds, resulting in faster honing action, (3) generation of closer parallelism between bores, (4) a minimum of mechanical chatter and (5) virtual elimination of swipes as the honing tool leaves the bore.

Sizing controlled mechanically

Operation of the tool is surprisingly simple. Although the gage itself is a unitary part of the tool, its operation is independent of the tool's expansion. It doesn't rotate and is equipped with carbide tips to minimize wear. Size control is entirely mechanical. For highest efficiency, the sizing gage should be used with a rigid drive-shaft type honing tool.

The sizing gage, mounted on the drive shaft just above the honing head, has four carbide-tipped contact points. It is a steel ring of split-type construction and may, therefore, be changed quickly or shimmed if necessary. The gage tips have approximately a 10° lead. This permits the gage to find and center itself with respect to the workpiece.

On each stroke of the machine, the gage tries to enter the bore, but is prevented from fully entering until the bore has been honed to substantially the correct size. Full entrance of the gage into the bore causes a block on the tool to trip a limit switch. This in turn causes the stone holders to collapse and stop honing.

Honing stones are mounted in steel inserts in a way to expose the entire cutting face of the stone. The advantage of this type mounting is its ability to bring the coolant to all cutting areas.

Still another advantage for this type mounting is that stone breakage is held to a minimum, substantially reducing replacement costs.

Ability to hold bore geometry within closer limits is attributed to several design and operating features of the new tools. They provide lower total pressure, and cooler and freer cutting action.

With modern tools—

Cleanliness, Flow Control Boost Coolant Efficiency

◆ Among other things, modern machining requires efficient coolants . . . For maximum benefit, flow must be directed to the chip-tool interface . . . And these fluids must be kept clean and at proper operating temperature.

◆ Coolant cleaners, refrigerators, special flow-control devices are worthwhile aids to efficient, low-cost machining and grinding . . . Most are versatile, can be adapted to practically any type of metal cutting or grinding equipment.

By J. E. HYLER, Consultant, Peoria, Ill.

◆ CLEAN COOLANT, directed efficiently and in ample volume to the metal removal area, is a critical factor in many high speed machining and grinding operations.

Due to increased machining and grinding speeds, coolants are more apt to become loaded quickly with swarf, fines and gritty residue. Such loading, even in moderate amounts, contributes to excessive wear on machine tool components, grinding wheels and cutting tool edges.

To combat the problem, manufacturers have developed automatic "coolant separators." Designed to separate magnetic and non-magnetic particles at coolant flow rates from 1½ gpm to 350 gpm, the several types made are universally applicable to most machine tools.

One model depends entirely on force exerted by permanent magnets to separate the coolant load. Another type supplements permanent magnets with a cloth filter to strain out non-magnetic particles. Some units are so compact that they can often be placed directly in the coolant reservoir. This eliminates additional piping.

A separator is usually wired into the machine circuit in connection with the stop-start switch on the coolant pump. Installation is comparatively simple for qualified plant maintenance personnel. It is not necessary to add extra coolant to compensate for the cleaning operation.

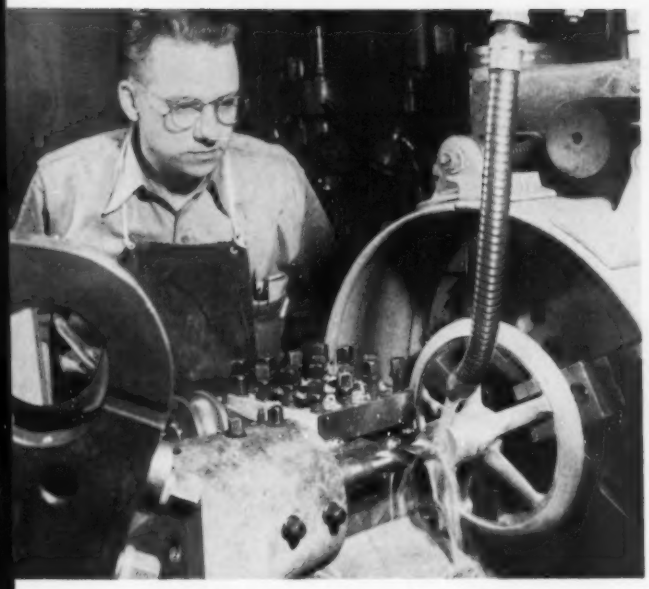
Continuous coolant filtration or separation often shows up favorably in cost analysis of finished products. Tool life, wheel life and machine productivity increase with use of clean coolants. Extension of useful grinding wheel life is sometimes as great as 50 pct, and less downtime is needed for wheel dressing.

Heat generation cannot be avoided in cutting metal, and it sometimes contributes to poor coolant performance. "Hot" coolant may be due to lack of coolant capacity in the system, or to inefficiency of the pump or recirculating path whereby one portion of the coolant supply passes through the system more often than the balance of the fluid.

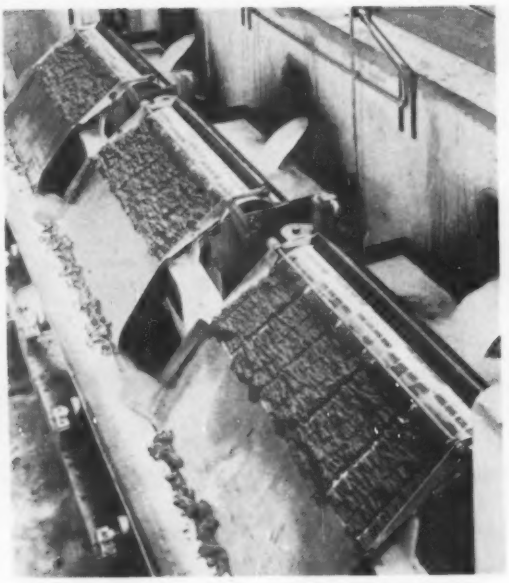
Refrigerate hot coolants

If either or both of these faults are corrected and coolant temperature is still too high, an auxiliary refrigerating device may solve the problem. Some widely used portable coolant systems make provision for refrigeration. Although they are portable, the units can be installed to become an integral part of an existing coolant system.

One special cooler uses a highly efficient refrigerant. The self-contained unit has an adjustable thermostat, will maintain cutting or grinding fluid temperature at 20°F below room temperature level, if desired. Or it can be set anywhere between this low point and a top



ADEQUATE coolant supply is directed into drill flute on this turret lathe drilling job.



MULTIPLE bank of magnetic coolant separators cleans cutting fluid in a central supply system.

level of 10°F above room temperature. The cooler is applicable to all types of machines, including grinders and honing equipment. It requires no water connections, provides an uninterrupted flow and will handle all conventional coolants.

Primary function of a coolant is to dissipate heat; secondary function is to lubricate the tool face in a machining operation. Object is to get the largest volume of coolant into the vital tool-workpiece friction area. In turning operations, many machine operators incorrectly direct coolant flow against the work just above the tool.

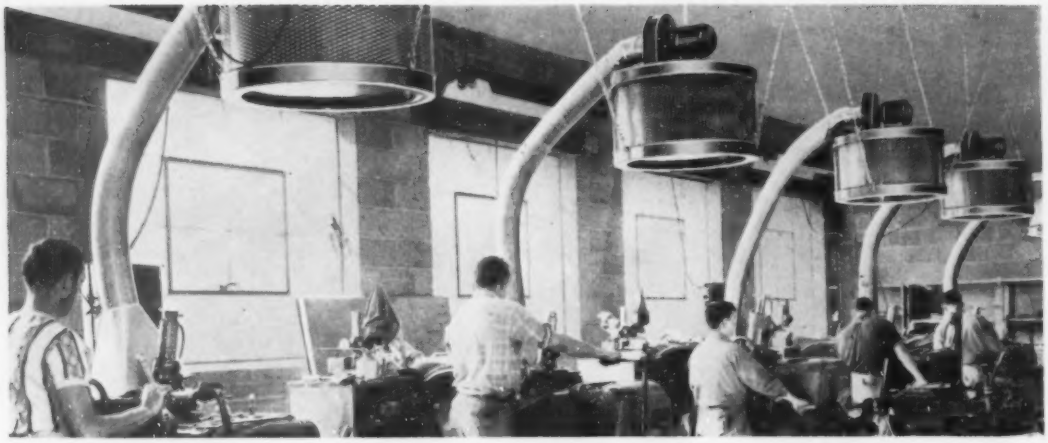
Actually, coolant should be directed so as to enter between tool edge and work at the point of cut. For all open cutting at low speeds, a full flow of coolant at low pressure seems to be the ideal method of keeping both tool and work "submerged." Pressure may be applied for better results where tools are used in holes.

Where carbide tools remove chips at high rates of speed, the "squeegee" action of chip on tool face removes lubrication rapidly. Unless a chip breaker is ground in the tool, the rapidly formed chip may block attempts to get a free flow of coolant to the critical area. With coolant flow stopped, heat buildup in the tool tip is intense. Resumption of coolant flow quenches the tip, and this alternate heating and quenching action can cause the tip to crack, thus shortening tool life.

In such cases, proper chip breaking must be integral with coolant control. Where high speed turning is done with carbide tools, it is essential to direct the coolant stream beneath the chip.

On single tool operations, the stream may be directed straight up from below so as to pass between the tool and the workpiece. It is advisable to grind a secondary clearance on the tool and to use increased coolant pressure, if possible. In some cases, two coolant streams may be used: both coming in from opposite sides of the tool and directed upward.

HEAVY duty drilling operation requires copious supply of coolant to reach the drill tip.



INSTALLATION of mist coolant condensers almost complete except for coolant return connections.

Sometimes it helps to drill the tool holding block so that an unobstructed flow of coolant can reach the nose of the tool. This practice is especially helpful where a number of tools are held in the same holder for simultaneous cutting action. The number of coolant passages to be drilled is governed by the job requirements.

Problem of applying coolant to end-working tools is different from that of supplying it to exterior cuts. For example, stationary drills, as used in screw machines and turret lathes, should have the coolant pipe parallel to the drill axis. Thus, coolant is directed almost squarely into the hole being drilled. Moreover, coolant flow should be adjusted directly into the flute of a drill to the greatest possible extent.

Dual flow might help

Getting coolant to the point of a horizontal drill is more difficult than it is with a vertical drill. And the task becomes harder as hole depth increases. Whenever possible, it is better to have a dual coolant flow for a screw machine or turret lathe drill; one flow along the top of the drill, the other along the bottom.

In some cases, a weir may be arranged to change direction of coolant flow and give it a better hole-penetrating effect. Unnecessary splashing should be avoided; fluid splashing off the workpiece does no cooling.

Dual coolant flow is also beneficial on heavy slab milling jobs. Here special nozzles can be paired to fan coolant out over the full surface of the work and the cutter so that it is directed both ahead of and behind the cutter. A similar fore-and-aft arrangement is also helpful on many surface grinding operations.

Some models of small surface grinders feed coolant into the grinding wheel so that centrifugal force carries it through the porous wheel structure. This makes it possible to grind fine finishes to close dimensions; also to grind thin sections without burning the work.

In some machining operations on cast iron or brittle materials, compressed air serves as a cooling and chip removing agent. One device is designed so that it will supply either liquid coolant or compressed air, as desired.

Where high speed machining or grinding operations use mist coolant, the mist can present a problem. It contributes to rapid accumulation of dirt on surrounding equipment, light fixtures, walls and ceilings. It also creates hazards by limiting the vision of operators.

Remedial steps have been taken by many manufacturers to collect and save this mist or fog in machine mounted units. Mists and vapors are collected by a flexible pipe, carried to a central condensing unit and returned to the coolant supply tank.

Air drawn up with the coolant mist is exhausted outside or recirculated in the room, at option. Special exhaust shells for these units make it possible to discharge smoke, fumes, odors or gases outside the building while collected mist is condensed and returned to the coolant sump.

Many times machines are operated with coolants other than cutting oil simply because the oil has a tendency to smoke. With a mist collector, this should be no problem.

In colder climates, companies often find it economical to recirculate heated air rather than exhaust it outside the building. One leading producer of gear hobs paid for an installation of coolant collectors in five years through heat savings alone. Extra savings accrue from the fact that less cleaning is required on walls, floors, lighting fixtures and production equipment when efficient coolant collectors are used.

On oxygen inverters—

Waste Disposal: Solution To New Problem

◆ AMONG the recent problems confronting steel industries is that of removal of a new type waste resulting from operation of oxygen inverter units. In converting iron to steel by this recently introduced process, finely divided iron particles and gases are released from the inversion vessels.

At the Trenton, Mich. plant of McLouth Steel Corp., the air pollution is solved by hooding the vessels to capture these gases. This removes objectionable fumes and particles before expelling to the atmosphere. It conforms to Detroit area regulations.

However, this creates another problem. Contaminated water from the air cleaning system contains suspended, finely divided iron oxide dust, less than five microns in size. This must be removed to produce a clean effluent. In addition, polluted waters holding grit, scale, oil and grease from the rolling mill, melt shop, air separator, boiler plant and pig machine must be cleaned.

To handle these waste treatment needs, Dravo Corp. of Pittsburgh constructed a plant for McLouth that clarified and neutralized waste water to more than meet the demands of the state's Water Resources Board.

Through a centralized sewer system, combined waste flows along a main 60-in. sewer to the treatment plant. Here waters, including that from the oxygen inverters, are first screened to remove oil, grease and scale. This is done in two rectangular tanks 65 ft long and 15 ft wide. These are equipped with heavy-duty grit and fine scale-removal units with oil skimming devices.

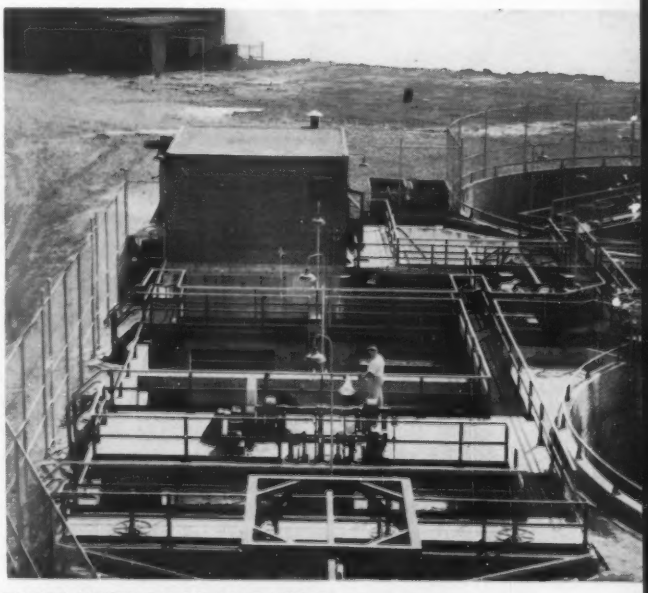
The flow, now containing suspended inverter dust plus some residue oil, then goes to an aeration-mixing tank. Waste pickle liquor and lime waste from the acetylene plant are then added. Walker Finerator units add oxygen to complete the chemical reaction and perform homogenous mixing.

Flows To Two Units

The mixture then flows to two 75-in. diam Walker Clariflow units where flocculation is accomplished hydraulically in the central inlet zone. Clarification is performed in the outer zone where the floc mass is allowed to remain at the bottom. The clear effluent rises vertically to the inward weir troughs at the surface. Skimming removes any residue oil or scum.

Under normal conditions, the cleansed water flows by gravity to the Detroit River. For operation at higher river levels, though, two vertical pumps are used.

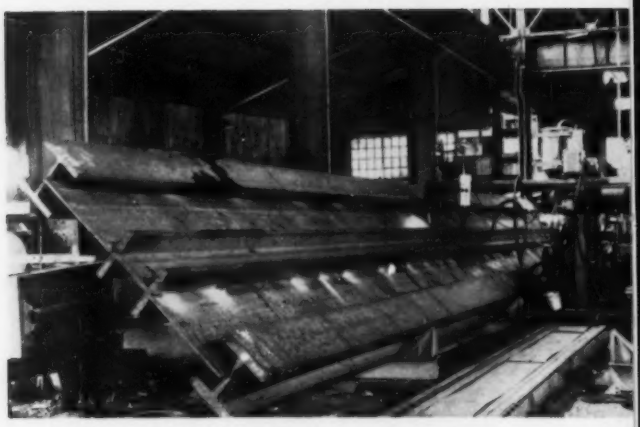
The complete plant, including structures, equipment and piping, was designed and constructed by Dravo to handle the present flow of 15,000 gpm, with possible future expansion by the addition of a third Clariflow unit.



THESE RECTANGULAR BASINS, 15 x 65 ft, remove heavy scale, grit and oil as part of waste treatment.

Lengths to 60 ft—

Automatic Setup Welds Structural Steel Fast



AUTOMATIC WELDING by submerged arc process proceeds at 20 ipm on 60 ft long structural beams.

◆ Faced with two fabricating problems, this shop tried joining with automatic submerged arc process . . . Results encourage additional applications . . . In one case, it saves 37 hours per assembly.

◆ Fabricating building columns from structural steel took 45 hours by hand, versus 8 hours on automatic equipment . . . Technique was found practical on wide-flange sections up to 60 ft long at speeds of 20 ipm.

By C. W. SHERMAN,
Staff Engineer,
Pittsburgh Bridge & Iron Works,
Rochester, Pa.

◆ AUTOMATIC submerged-arc setups can handle both simple and complex structural steel welding jobs fast and economically. In one case, automatic equipment pares 80 pct from time required to manually join 40-ton assemblies made up of standard steel beams.

In another, one operator controls weld-fabrication from plate stock of wide-flange beams up to 60 ft long. Shortage at the particular time of wide-flange (WF) sections brought about this operation.

The 40-ton building columns each comprise two parts. One half column subassembly calls for eight continuous welds totaling about 480 running ft. Formerly it took about 45 manhr to join three beams and two plates into a half column. With automatic submerged arc equipment, an operator finishes the job in one 8-hour shift.

Use of the automatic submerged arc process in welding structural steel came about largely from a shop order for 134 building columns, 40 to 60 ft long. Welding the longer columns presented several problems.

The center shaft (building column) is a 14 WF 314 beam. Righthand crane column is a 14 WF 426 beam. Lefthand crane column is a 14 WF 264 beam. Numerals before letters WF designate nominal depth in inches, and those following indicate weight in pounds per running foot.

Joined by web plates

Diaphragm plates connect crane columns to building columns. They measure ¾ in. by 30 in. by 60 ft long.

Continuous 5/16 in. fillet welds on all sides join plates to WF sections. This totals eight continuous welds 60 ft long for each half column, or 480 ft of weld.

Fitting together of all components to make up a completed half column presented a couple of difficulties. First, automatic welding requires a fairly clean surface. Second, a close fit between web plates and WF sections was necessary.

Wire brushing immediately before fitting solved the first problem. Operators had only to wire brush a line approximately 1½ in. wide down the beam center where the ¾ in. thick web plate joins the section.

Fitup problem was a bit tougher to eliminate, due to extreme rigidity of the sections involved. Exercising a little more care in flame burning the ¾ in. web plates and using jacks and pull lifts enabled a satisfactory fit.

Avoid porosity, cracks

Initially, operators attempted to tack all components together with an ASTM-AWS type E-6012 welding rod. Later developments, such as cracked tacks and porosity in the weld deposit, impelled a change to low-hydrogen electrodes.

The automatic welding setup was developed in conjunction with The Lincoln Electric Co., Cleveland, and Cecil C. Peck Co. The latter modified one of its standard units to mount two 600 amp dc generators, a flux recovery unit and an automatic reel for the main power supply cable. Welding head incorporates an automatic flux valve.

Entire unit rides on an 80 ft long track at floor level. The head travels 70 ft in welding one half column, then swings around 180° on its boom to weld another on return. This eliminates need for a "quick return" on the carriage.

Operators position two half columns at a time, one on each side of the welding track. Both incline at 45°. While welding of one column progresses, operators turn the half column on the other side. On completing one 60-ft pass, another weld on the opposite half column can be started immediately. This gives as close to 100 pct efficiency as could be hoped.

For the 5/16 in. fillet weld, the shop employs a reel of L-60 welding rod and 760 flux. Equipment is set at 33v, 900 amp. This permits a welding speed of approximately 20 ipm.

Prior to installation of automatic welding equipment, operators welded a few of these columns manually. A careful time check revealed it took 45 manhr to fully weld by hand one complete column 60 ft long. Later studies of time involved in joining with automatic welding show this figure dropped to 8 hours. This plus consistently good welds and ease of flux removal encourages consideration in the shop of automatic welding wherever at all feasible.

WELD-FABRICATING wide-flange beams 60 ft long cut from plate stock is handled automatically.

Shop-fabricated beams

Shortage of WF sections caused the step into weld-fabrication of 60 ft long wide-flange beams from plate stock. A contract calling for about 1500 WF sections not immediately available precipitated the situation.

Operators flame cut plates to size, matching web and flange dimensions with those of the required WF section. After fitup in a jig, workers tack weld plates, using a low hydrogen electrode to encourage a sound weld. On positioning in a cradle, welding of plates proceeds.

Two 600 amp dc generators comprise main section of welding equipment. Tractor welder carriage mounts an LAF-3 head with automatic flux valve and vertical lift adjuster. Self-propelled tractor carriage rides on an inverted 15-in. channel. Angles welded to channel accommodate tractor wheels. This avoids need for manual guiding.

The setup enables welding 60 ft long sections at 18 ipm with a ⅜ in. fillet weld. Rod and flux match those used in the welding operation described previously. Current is 36v, 860 amp.

A framework of lightweight angle sections carries the power cable. This not only cuts wear and tear on the cable, but also minimizes drag on the tractor.

Strengths to 3000 psi—

No-Heat Adhesives Simplify Joining Problems

◆ Adhesive bonding is not only suitable for many metal-to-metal or metal-to-plastic joining problems —it's often the only practicable solution . . . Latest epoxy-based formulations cure without heat, offer high-strength, simple-to-make, trouble-free joints.

◆ Take Memco Engineering & Mfg. Co. . . . Faced with two tricky joining problems, this power switching equipment manufacturer turned to a new 100 pct solid, epoxy-based material . . . Without heat or pressure, the material effects bonds capable of strengths to 3000 psi.

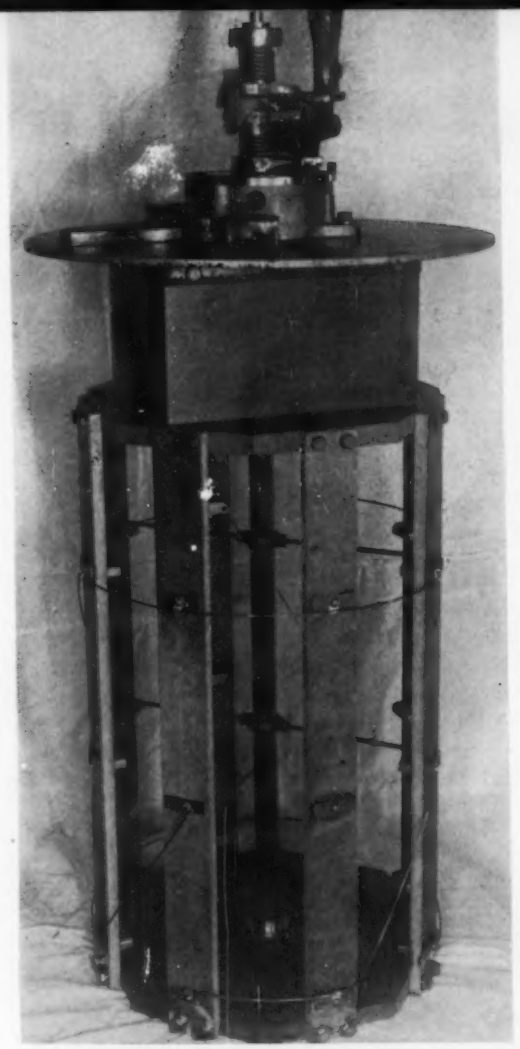


FIG. 1. Three beryllium copper blades within cage of this 93 kv switch attach to central Mykroy shaft through small, adhesive locked castings. Adhesive assures trouble-free service.

◆ ADHESIVE BONDING is not only suitable for many of today's metal-to-metal or metal-to-plastic joining applications — for some, it's all but indispensable. Particularly useful are certain of the new epoxy-based adhesives. These cure at room temperature, without heat or pressure, in a relatively short time.

Surprisingly high strengths are obtainable with these bonds. One such preparation is Bondmaster M648. This was developed by Rubber & Asbestos Corp., Bloomfield, N. J., for metal-to-metal joining or bonding of other rigid materials.

With it, tensile strengths (aluminum to aluminum) of better than 3000 psi are obtainable.

Among the companies quick to recognize the possibilities of the material was Memco Engrg. & Mfg. Co., of Commack, L. I., N. Y. Memco makes power switching equipment. Within a short time, the material was tried and adopted for two tricky joining problems.

The first of these involved production of a high voltage (93 kv) switch. This was built for the Buell Engrg. Co. of New York, to serve as both a transfer and quick-break switch for use with Buell's precipitator equipment.

Structure of the switch is shown in Fig. 1. The lower part of the cage consists of three beryllium copper blades attached to a central shaft, and spring-actuated by the handle above the steel plate. This handle includes the quick-break mechanism as well as the means for in-

dexing. The mechanisms prevent the operator's moving more than one set of contacts at a time, while providing the necessary quick break from one to the other set of contacts to help avoid arcing.

These switches are immersed in a transil oil bath, and therefore have to be made of something impervious to oil. Mykroy, a very hard synthetic substance, was chosen as the shaft material for this service.

The problem was then to attach the three bronze castings carrying the switch blades to the 1⅛-in. diam shaft.

This was accomplished by cementing with the epoxy-based room temperature adhesive. The adhesive, properly mixed with hardener agent, was spread on the clean and dry surfaces and the three small bronze castings were pushed up the shaft into position. This involved some smearing of the material along the shaft, of course—and meant some subsequent cleanup.

Second purpose served

Memco's second application for the improved adhesive was found when they set about to redesigning one of their 69 kv, 1200 ampere high tension air-break switches.

This switch, subject to the ruggedest kind of outdoor service, is partially shown in Fig. 2. A small but highly important part of this switch is the contact jaw at right. Nested within his assembly is a little barrel-shaped casting, containing a stainless steel spring which holds the jaw in the open position when the entire switch is open.

Operation of the switch can be visualized by referring again to Fig. 2. The tubular blade swings toward you laterally, out from the paper, that would be, as the insulator at left rotates on the bearing out of sight beyond the lower left hand corner of the picture. This action swings the pivoted six-fingered jaw also out of the picture and the spring referred to holds it firmly in this open position.

The spring housing—also of Mykroy and cylindrical and fairly short in shape—contains a plug tipped with a stainless steel spherical-headed stud.

This assembly serves a double purpose.

First, it acts as an insulator, in keeping the spring from the main body of the switch. This prevents any current passing through the spring with the possibility of annealing it under short-circuit conditions.

At the same time, it's necessary that the plug be pivoted, since there is some movement between the housing and the other parts of the overall assembly. The stainless steel pin acts as the pivot to permit this movement of the spring assembly.

This has been a relatively small application, Memco says. But it's one they don't know just how they would have solved had they been forced to use some other method.

Memco used the standard formulation, without heat to speed curing and without special hardeners. However, the makers of the material report varying degrees of shock resistance and peel strength can be obtained by using different hardeners. With the standard hardener, a strong bond develops in 4 to 6 hrs, permitting the part to be handled. About 85 pct of full strength develops in 14 to 24 hrs, and full strength in a week.

Accelerated cures can be had for applications where physical curing cycles are required by heat curing for approximately 2 hrs at 100°F, for 30 min at 150°F, for 15 min at 200°F or for 10 min at 250°F.

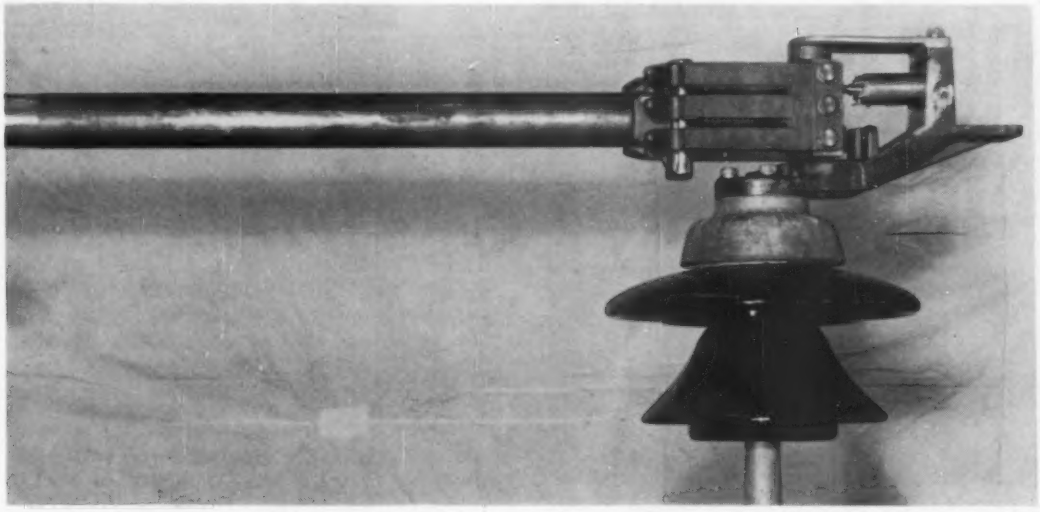


FIG. 2. Small, barrel-shaped casting houses spring, Mykroy plug. Stainless steel pivot tip is cemented to end of Mykroy plug for insulation, proper assembly action when the switch is thrown.

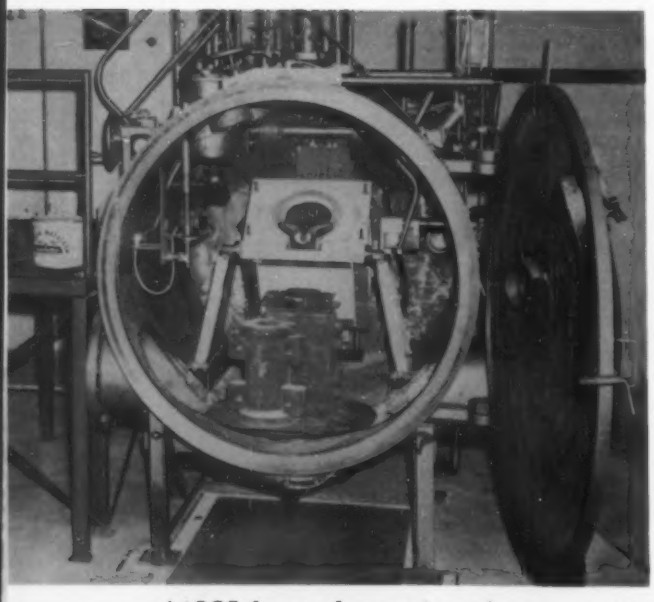
For hot spots—

Bright Future Seen for Vacuum Investment Castings

◆ Growing number of high-temperature applications demands unique alloys with top heat-resisting properties . . . Recent trend is to use high-strength parts wrought from vacuum melted materials.

◆ Tests show that vacuum investment castings may be better than wrought products in some areas . . . But investment casters lack a low cost vacuum remelt furnace . . . Problem may be remedied soon.

By F. KENNETH IVERSON, Chief Metallurgist, Cannon-Muskegon Corp., Muskegon, Mich.



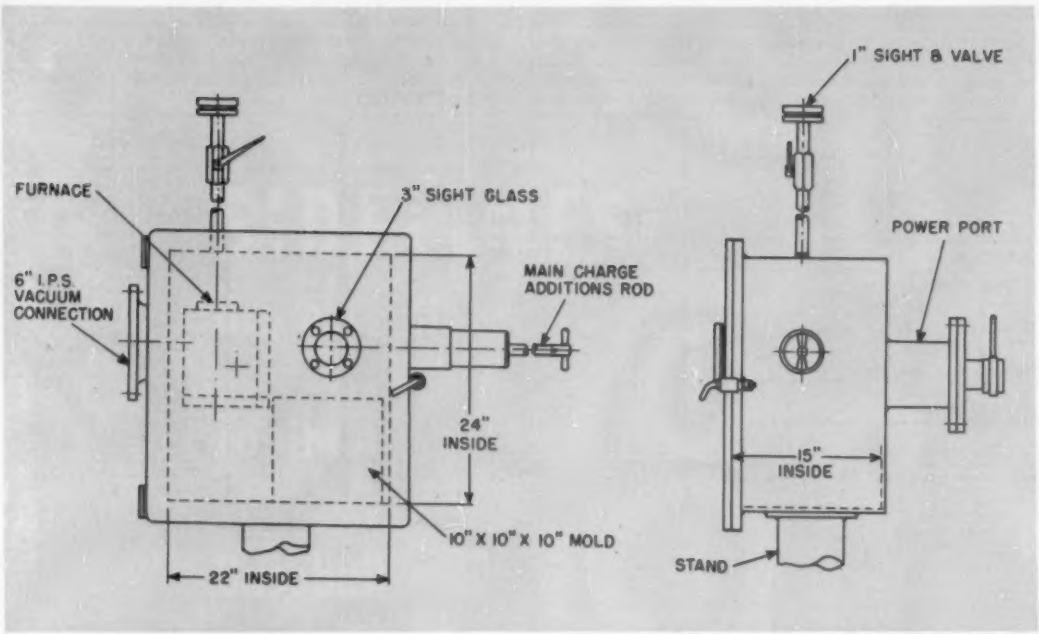
LARGE furnace for experimental vacuum casting contains 400-lb capacity induction furnace and mold table that rotates through vacuum seal.

◆ VACUUM MELTED alloys have proven their superiority in numerous high-temperature applications. Because of this, many consumers of investment castings for high-temperature service have switched to parts that are forged or otherwise wrought from vacuum melted alloys.

Preliminary tests indicate that investment castings, made from vacuum melted alloys and poured under vacuum, can give certain desirable properties that equal or surpass those offered by wrought vacuum materials. But at present, the majority of investment casters are not equipped to take advantage of this opportunity.

There are two basic processes for making investment castings from vacuum melted alloys. One involves remelting and casting the alloys under an inert gas, generally argon. Other involves melting and mold pouring under vacuum conditions.

In the argon remelting and casting process the metal never comes in contact with air. This is not too difficult to accomplish. The furnace must be fairly well enclosed but not necessarily air tight. Argon is fed continuously and a slight



LOW cost Stokes unit with small, 8-lb furnace is specifically for remelting and investment mold pouring of vacuum melted alloys.

positive pressure is maintained in the furnace chamber. When the metal reaches pouring temperature, the investment mold is clamped onto an argon gas connection and purged for a few minutes.

Argon technique is economical; an existing furnace can be modified for argon melting for $400 to $500. The method also yields production rates approaching those of conventional air melting. In addition, where high-temperature alloys contain aluminum and titanium, argon remelting yields properties that compare favorably with those of the original vacuum melted material. For example, stress rupture life is in the range of 80 pct of the full value for the vacuum melted alloy itself.

Argon losses high

But argon remelting has some disadvantages too. There is a continuous loss of argon which results in high melting cost. Exact cost depends on chamber size and tightness as well as gas flow rate.

Also, tests indicate that many vacuum melted alloys lose most if not all of their superior properties when remelted under production argon conditions. For example, with high temperature alloys that do not contain aluminum and titanium, argon remelting yields final properties that are little better than those obtainable from quality air melted material.

Another disadvantage is the difficulty of controlling quality in an argon protected melt. The operator has no way of telling whether the argon blanket is good or poor, can only evaluate melt quality by eventual performance of the castings themselves. By contrast, accurate pressure gages enable a vacuum furnace operator to judge the condition of his melt at all times.

It might be feasible to have a mass spectrometer reading gas conditions inside the argon furnace. But even if several furnaces were to be monitored by the same instrument, cost of such equipment would be substantial.

Job of producing investment castings under vacuum can be done by starting with an air melted base alloy or prime raw materials. It involves melting, bridge-breaking, deoxidizing, alloy additions, and investment mold pouring. Initial capital outlay would be high for an elaborate furnace having all the gadgetry needed to do a thorough alloy melting and refining job.

But investment castings can also be made efficiently and economically by remelting already prepared vacuum alloys bought from commercial producers. No alloy additions are necessary. Material is simply remelted and poured into investment molds under vacuum.

EDITOR'S NOTE

This article contains material prepared by the author for a recent speech to the Investment Casting Institute.

Cost Comparison Between Air, Argon And Vacuum Investment Casting

CONDITIONS: 1. ½ lb casting. 2. Eight castings per mold. 3. 50% yield not including rejects. 4. 30% rejects for high alloy castings and 15% rejects for low alloy castings. 5. 30% margin for high alloy material and 20% margin for low alloy materials. 6. Vacuum metal cost—$3.00 per lb over comparable air melted alloy. 7. Figures include depreciation and overhead. 8. Vacuum investment furnace—initial cost $60,000—capable of pouring 10 flasks per hour.

Item	High Alloy Material			Low Alloy Material		
	Air	Argon	Vacuum Remelt	Air	Argon	Vacuum Remelt
Mold Cost	$ 35.00	$ 35.00	$ 35.00	$ 28.00	$ 28.00	$ 28.00
Metal Cost per Mold	16.00	40.00	40.00	3.20	27.20	27.20
Melting Cost per Mold	2.60	5.20	9.70	2.60	5.20	9.70
Cleaning Cutoff & Inspection	18.00	18.00	18.00	8.00	8.00	8.00
Total Cost	71.60	98.20	102.70	41.80	68.40	72.90
Minus Metal Returns	6.24	6.24	6.24	.55	.55	.55
	65.36	91.96	96.46	41.25	67.85	72.35
Margin	19.61	27.59	28.94	8.25	13.57	14.47
	84.97	119.55	125.40	49.50	81.42	86.82
Selling Price of Casting	$ 15.17	$ 21.35	$ 22.39	$ 7.28	$ 11.97	$ 12.77
Increase in Price over Air Melting	.....	40.3%	47.7%	.....	64.4%	75.3%

Both vacuum casting systems have an obvious advantage over argon remelting: they can be used with all vacuum melted alloys and yield the maximum potential in superior properties. But the vacuum remelting process has two additional advantages:

1. A vacuum heat made from prime materials needs twice the melting time required for a simple remelting operation. This means that remelting can produce twice as many castings in a given period of time.

2. A furnace designed specifically for vacuum remelting and investment mold pouring would cost much less than a furnace designed to make and refine prime vacuum alloys.

Cannon-Muskegon Corp., Muskegon, Mich., is one of a number of firms prepared to supply investment casters with quality vacuum alloys for remelting purposes. For the past year, the firm's engineers have consulted with vacuum equipment manufacturers in an effort to obtain a relatively inexpensive furnace specifically suited for vacuum remelting and investment mold pouring.

An accompanying sketch shows the basic features of one such furnace being developed by F. J. Stokes Corp., Philadelphia. Cost, except for power supply, is estimated to range between $5000 and $8000. However, it should be possible for many investment casters to apply their present power generating equipment to this remelting unit.

Induction furnace inside the vacuum chamber will melt an eight pound slug of vacuum alloy in approximately three minutes, can pour 10x10x10-in. molds at a rate of eight to ten molds per hour.

Typical cycle for this vacuum remelting and casting setup would involve the following operations:

1. Load both the charging chamber and furnace with slugs of vacuum melted alloy.

2. Place a hot investment mold inside the chamber and close the door.

3. Turn on vacuum pump mechanism to rapidly reduce pressure in the chamber to less than 10 microns.

4. Melt furnace charge. Control melting cycle according to elapsed time and power input or by optical pyrometer readings through a sighting opening.

5. Pour molten furnace charge and transfer billet slug of vacuum alloy from charging chamber to furnace.

6. Wait one or two minutes for investment casting to solidify and for furnace to cool to a non-oxidizing temperature.

7. Open door, remove investment mold.

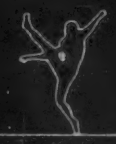
An accompanying table shows cost comparisons for air, argon and vacuum investment casting techniques. Figures are not necessarily representative of the industry at large although they do represent the costs of some actual investment casters. Vacuum remelt figures are based on a $60,000 furnace, depreciated over a two-year period on a one-shift operation. They would be lower if computed for the inexpensive remelting furnace now being developed.

Cost comparison table also assumes a constant rejection rate regardless of melting method. If reject castings result from pattern or mold inperfections, vacuum melting will not reduce them. But if they stem from faulty metal, vacuum melting may reduce the rate significantly.

Outstanding fact from the comparison is that vacuum investment castings do not have to sell for four times, three times or even twice the cost of air melted castings. Actually, some observers predict that the time is not far off when these vacuum castings will cost less than a third more than the air melted variety.

SIDELINES

are essential to

Football 

Baseball

Tennis

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VICE-PRESIDENT, THE CINCINNATI GEAR CO.

How do *you* go about buying gears for your products? Get the best price in order to "save" as much money as possible? Well, economy *is* important, and maybe you can save some money if you consider only the original cost — a few pennies on the price tag of each gear. But how much is this "saving" (if realized) in the *percentage* of the total cost of your product — one or two percent?

Such an amount can disappear in a hurry. A gear is a very critical part in a product; it has a lot to do with the efficiency of the product and the ultimate satisfaction the product gives your customer . . . an importance far beyond its relative size *or price*. That's why we say the *right* gear is more important than the *cheapest* gear.

Certainly, in competitive times such as these, it is necessary for any manufacturer to reduce costs wherever possible. But when cost-cutting affects product quality or efficiency, watch out. The saving in dollars and cents on a "cut-price" gear is usually pretty small, if there is a saving at all, over buying the gear that is assuredly "right" for the job. And if your specifications indicate possible use of a custom gear, talk to someone from Cincinnati Gear first and let him point out the advantages of custom gearing, and how good gears can be an economy in the long run. You'll find that putting the major emphasis on getting the *right* gear for the job will pay off handsomely.

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New Technical Literature:

Catalogs and Bulletins

Self-aligning bearings

Production of a new line of self-aligning plain spherical bearings for the commercial market is announced in new literature. They have the same high craftsmanship of firm's earlier bearings but will be mass-produced with less costly materials and consequently will sell at a lower price range. They reduce lost motion in linkages and withstand excessive vibration; carry heavier loads than anti-friction types since they have a greater surface supporting area. Made of one-piece ball and one-piece race, they offer increased radial and axial thrust load. *Southwest Products Co.*

For free copy circle No. 1 on postcard, p. 129

Visual aids

"Visualization Made Easier" is the title of a new 20 page catalog describing a method of making organization and flow charts, graphs, office and plant layouts. Method consists of "drawing" charts, graphs, and layouts with pressure sensitive tapes and templates. Commonly recognized lines, shapes, bars, symbols and die cut office furniture templates are pre-printed on tapes or sheets with adhesive backing. The completed charts and layouts may be displayed or may be reproduced by any standard method. *Chart-Pak, Inc.*

For free copy circle No. 2 on postcard, p. 129

Annealing system

Giving operational views and describing the features of a convection annealing system for nonferrous metals, a six page bulletin includes descriptions of a new type radiant tube with inputs up to five million Btu. per hr. It also covers a specially developed plenum chamber that increases efficiency of gas flow over the charge. *Lee Wilson Engineering Co., Inc.*

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FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 129.

Underdrive presses

A 32-page illustrated catalog shows company's line of single, double and triple action underdrive presses, ranging in capacity from 400 to 2000 ton. Largest bed-size shown in the catalog is 200 x 100 in. but manufacturer advises that larger bed sizes, as well as capacities over 2000 ton are designed and manufactured when required. Also illustrated are accessories. *Danly Machine Specialties, Inc.*

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Thermocouples

Firm's new complete catalog of thermocouple assemblies and pressure sealing glands introduces company's new check wells, speedwells, multiple wire thermocouple glands, pressure sealing spring loaded thermocouples and flex-tube assemblies. In addition, firm's complete engineering and manufacturing facilities for fast delivery on special thermocouple assemblies is mentioned. *Conax Corp.*

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Gage data sheet

Single data sheet pictures and describes 17 and 24 in. gages. It is said to be an independent, self-contained instrument that eliminates need for gage blocks, transfer measuring equipment or reference gages of any kind. It is said to be the fastest way of accurate height measuring. *Pacific Gage Co.*

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Welded steel tube

Engineers and others involved with the design, maintenance or repair of condensers and heat exchangers are expected to receive benefits from the information and data contained in this six-page technical folder. Bulletin emphasizes quality, dependability and economy of electric resistance welded carbon steel tubing in applications involving heat transfer. A chart outlining the hydrostatic test pressures required for various tube sizes is also shown. *Tubular Products Div. Babcock & Wilcox Co.*

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Conveyor belts

New 16 page booklet "A profitable approach to the selection of steel processing conveyor belts" has been made available. Booklet discusses company's line of standard steel processing belts which are said to handle more than 90 pct of all conveyorized processes requiring durability and strength of a plain or stainless steel belt. It gives specifications and outlines a simplified plan for belt selection. *Colorado Fuel and Iron Corp.*

For free copy circle No. 8 on postcard, p. 129

Metal sheet

Six page brochure of industrial and decorative perforated metal sheets is expected to be very valuable to industrial users, architects, building contractors, sheet metal fabricators and designers or stylists in all fields where perforated metal can be used. Information as to sheet sizes, type and gage of metal and percent of open area is given. Perforated patterns are illustrated at actual size. *Harrington & King Perforating Co., Inc.*

For free copy circle No. 9 on postcard, p. 129

Conveyor literature

An 8-page folder on the uses and advantages of lightweight overhead conveyor units illustrates and describes ten typical industrial uses for the lightweight conveyor. Complete specifications are included. *Jervis B. Webb Co.*

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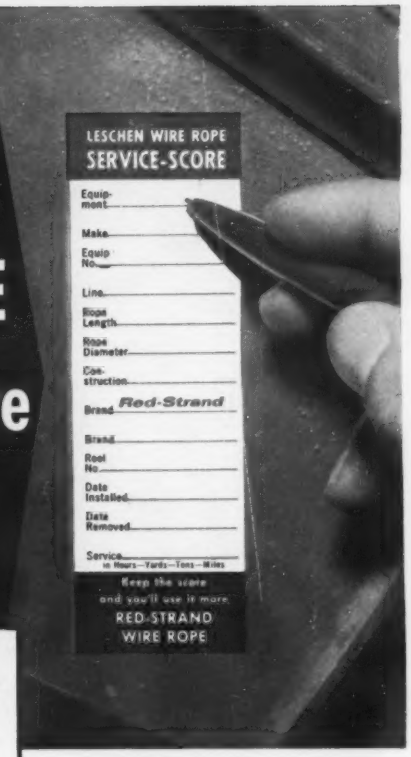
Now Leschen Offers

NEW WIRE ROPE Service-Score System



Simple plan tests wire rope performance and costs—shows comparative values—helps reduce operating expenses—speeds reordering.

Leschen's quick-fact-finding Service-Score System utilizes easily applied, easily removed pressure sensitive stickers, which record equipment and rope data, dates of rope installation and removal.

What is your *true* wire rope cost? Do you know? Are you using the right rope type or construction? The right brand?

Questions like these are readily answered with Leschen's new Wire Rope Service-Score System. Service-Score stickers report performance—type versus type, brand versus brand. Performance facts reveal costs and help *cut costs*.

Service-Score stickers provide easily-available, *helpful reordering data*—wire rope diameter, length, construction, date installed, and date removed.

Service-Score stickers remind operators when it's time to replace rope—*increasing safety* margins.

Service-Score records enable you to check and compare wire rope types and constructions. For example, you find for yourself, as others have, that Red-Strand consistently scores high. You learn the advantages of super-strength Porter Imperial Red-Strand, or Hercules Flattened Strand.

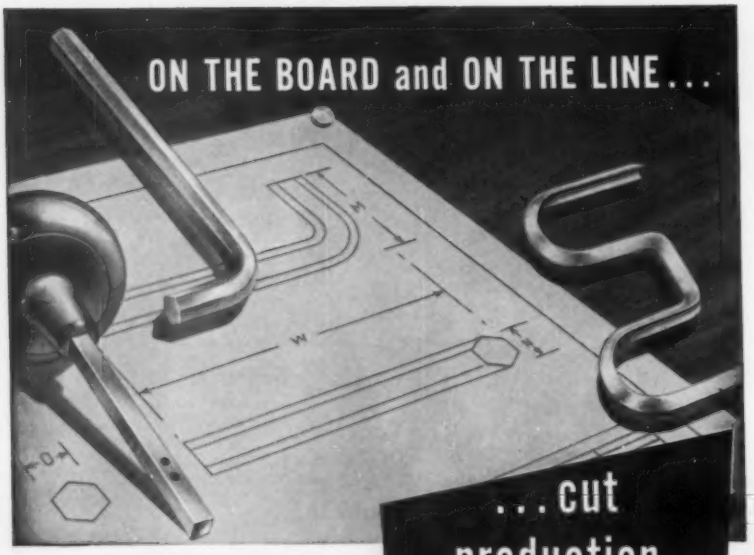
Write for sample stickers. Or see your nearby Leschen Wire Rope distributor.

LESCHEN Red-Strand WIRE ROPE

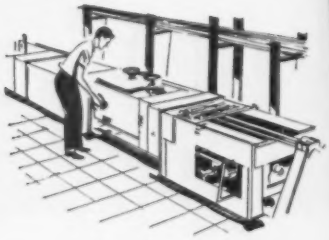
HKP division of H. K. PORTER COMPANY, INC.

Keep the score and you'll use it more Red-Strand Wire Rope

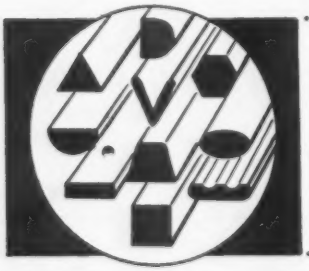
LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri



...cut production costs with CONTINENTAL Special Shaped Wire



You can engineer greater savings in production when you use Continental round or special shaped wire. Usually you can reduce costs on expensive forging, stamping and rolling operations by using Continental special shaped wire. For product-trim or as a basic component, the right wire can help you cut corners—and you can get the right wire at Continental. We have solved countless problems in supplying wire for thousands of applications, in a great range of sizes and shapes, temper, finish and analysis in low or medium low carbon. Before you fill any wire need—check with Continental, wire headquarters for many firms. Write us today.



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flat	keystone-shaped
half-round	V-shaped
round	hexagonal
oval	grooved flat wire
half oval	special wire trim designs
square	bread-shaped
rectangular	D-shaped

CONTINENTAL

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WIRE SPECIALISTS FOR OVER HALF A CENTURY

Producers of Manufacturer's Wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

FREE TECHNICAL LITERATURE

Mill feed control

Company has just published a new eight page catalog on its grinding mill feed control. It is an electronic device which automatically regulates feed material flow, wet or dry, to a continuous grinding or pulverizing mill. It eliminates the human factor, maintains constant mill loading regardless of variations in feed characteristics, prevents overloads, and increases mill grinding efficiency 10 to 20 pct, firm says. *Hardinge Co.*

For free copy circle No. 11 on postcard, p. 129

Manufacturing costs

"Lower Manufacturing Costs" is a new booklet on nondestructive testing systems. It examines testing as a production tool, where it can help to increase the output of satisfactory parts, and increase profits. It presents some of the philosophy behind the use of test systems in manufacturing. Several actual case histories appear. *Magnaflux Corp.*

For free copy circle No. 12 on postcard, p. 129

Track performance

"The Right Track," tells the story on track performance and development. Booklet discusses track construction piece by piece. Track link design, track shoes, track bolts, pins and bushings all are considered from a production viewpoint. Research tests, prechecked steel, selective heat treatment, precise machining, and rigid inspection all contribute to the development of the "Right Track." Spanish, French, and Portuguese versions of this eight-page booklet are also available upon request. *Caterpillar Tractor Co.*

For free copy circle No. 13 on postcard, p. 129

Bronze electrodes

World's largest producer of bronze electrodes recently printed this latest revision of a four-page welding rod applications bulletin. Attractively illustrated, it describes characteristics, properties and sizes of the five grades of firm's electrodes, both ac and dc. Typical applications are listed for each grade. *Ampco Metal, Inc.*

For free copy circle No. 14 on postcard, p. 129

How Eastman Kodak gets
Extreme accuracy...fine finish... years of trouble-free grinding

Norton wheel spindle a key factor in grinding performance that means...

steady savings!

Installed In March 1936 at Eastman's Kodak Park Works in Rochester, N. Y., this Norton 10" x 96" Type C Cylindrical Grinder grinds alloy steel rolls to precision accuracy and very fine finish. Original wheel head spindle bearings have required no servicing in more than 18 years of 8 to 24 hours daily operation.

The Norton Wheel Spindle Unit is an outstanding aid to the speed, accuracy and long service life of Norton cylindrical grinders. Note its over-all ruggedness and big heavy bronze bearings covering over half the spindle body.

Why are Norton cylindrical grinders so fast and accurate over such a wide range of precision finishing and heavy stock removal jobs?

Why do these hard-working machines last so long, cost so little to maintain?

Advanced features like the Norton wheel spindle unit are the answer. Advantages of this typical Norton development for better, lower cost grinding include:

- *Over 50% of spindle body enclosed in two large heavy-duty, hard bronze bearings for extra long life.*
- *Rugged proportions, and metals toughened by special heat treating, are further aids to long service.*
- *Rigid support over practically the entire spindle surface affords maximum resistance to wheel pressures.*
- *Bearing length of more than twice the diameter increases bearing life.*
- *Automatic flood lubrication of bearings, with flow continually visible through bull's-eyes — an important safety and control feature.*
- *End thrust taken on two large, hardened steel surfaces, also flood lubricated.*
- *Modern precision boring for exact oil clearance keeps lubrication at top efficiency.*
- *Wheel speed changes possible without readjusting bearings.*
- *Extremely low unit pressure, due to long, continuous bearing surfaces, permits fast cutting and enduring accuracy.*

For further facts on how Norton cylindrical grinders can benefit your production, see your Norton Representative. Or write direct for Catalogs. And remember: only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower cost. NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

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Making better products... to make your products better

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Multiple sources for "Things" not called SPRINGS

Yours to put to work . . . . our mechanical ingenuity and craftsmanship . . . . experienced in producing an infinite variety of metal parts in such fields as automation, communication, medical, electronics, safety devices, product development, etc. The capacity of ASC springmaking minds and machines is unlimited. Ask any Division to examine your sample or blueprint.

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- B·G·R COOK PLANT, ANN ARBOR, MICHIGAN
- SEABOARD Coil Spring Div., 15001 S. BROADWAY, GARDENA, CALIF.
- OHIO DIVISION, 1825 EAST FIRST ST., DAYTON, OHIO
- WALLACE BARNES COMPANY, STATE FAIR BLVD., SYRACUSE 9 (Salina), N.Y.
- MILWAUKEE DIVISION, 241 E. ERIE ST., MILWAUKEE, WIS.
- DUNBAR BROTHERS COMPANY, BRISTOL, CONN.
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EVERY MANUFACTURER who tries Roebling high carbon flat spring steel discovers the same thing... that this spring steel is absolutely unexcelled for dimensional and mechanical uniformity... for speeding production and cutting down rejects.

You always *pay* for the best when you buy flat spring steel... make sure you *get* it by specifying Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

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Subsidiary of The Colorado Fuel and Iron Corporation

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(Aluminum Company of America photo).

At one stroke this press can forge pieces 10′ wide or 24′ long. It can change a 2,000-pound aluminum slab into a complicated aircraft component . . . saving material as well as machining and assembly time. Cast and forged nickel alloy steels provide the strength and toughness needed in columns, cylinders, die-block holders and dies of this giant machine. Among the first of the facilities in the U. S. Air Force Heavy Press Program, this unit is a notable engineering achievement of United Engineering & Foundry Co., Pittsburgh, Pa.

Nickel alloy steels strengthen huge press for 35,000-ton squeeze

EIGHT 200,000-POUND FORGINGS of steel fortified with 2¼% nickel! That's what was specified to give this mammoth press essential strength. Used as four 2-column units, these forgings are subjected to the tremendous force of 35,000 tons.

Nickel alloy steel provides the level of strength and notch toughness required. These massive columns are each 61′ high and 34″ in diameter. Whenever a component's size restricts methods of heat-treating, or permits forging only limited portions at a time, improved strength and elastic properties depend particularly upon correct alloy content.

Nickel alloyed steels are used for still other parts that encounter high stresses and loads.

Dies and die holders gain needed stamina from additions of nickel. Among the largest steel castings ever used in press construction, the top and bottom die holders of this press are nickel-chromium-molybdenum steel approximating the 4340 composition. Each measures 26′ by 12′ by 25″ and weighs 350,000 pounds.

In many a metal, you can improve specific properties by use of nickel alone or in combination with other alloy elements. When you seek the solution to a metal problem, let us give you the benefit of our wide practical experience.

Send the details of your difficulty for our suggestions. Write us now.

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 124.

Wire forming

Brochure entitled "Wire Forming Specialists" describes company's ability and facilities for pointing, forming, stamping and finishing of products and components made from 0.015 to 0.250 in. diameter wire. In addition to formed wire products it shows pointing, threading and other wire end operations. *Risdon Manufacturing Co.*

For free copy circle No. 15 on postcard

Molded pulp packaging

Six page folder gives a case history where firm's molded pulp for industrial packaging doubled a user's output. It also pictures and explains several different applications of the product. Fibre forms can be molded in an exceptionally wide range of weights, shapes and sizes to give the greatest protection at the lowest cost in shipping and handling anything from valves to gear assemblies—from auto fenders to furniture, says the folder. *Arvey Corporation, Fibre Forming Div.*

For free copy circle No. 16 on postcard

Bearing material

Proper material for sintered bronze or iron bearings, said to be a major problem to design men, is included in a new chart. It shows the complete chemical, mechanical, and work characteristics of a wide range of sintered bearing materials. The chart is described as so easily read that the best material for most applications can be selected by a draftsman in a matter of minutes. *Bound Brook Oil-Less Bearing Co.*

For free copy circle No. 17 on postcard

New pricing catalog

Eighty-four page 8½ x 11 in. catalog gives absolutely complete, well illustrated, colorful and easy-to-use rundown on firm's line of products. It replaces most of the company's previous pricing catalogs, discount sheets, price change notices and miscellaneous pricing forms. It emphasizes that these can, and should, now be destroyed and replaced with this. Most of the special wheel shapes shown can be priced in the same simple manner as straight wheels, it states. All of the listings are effective July 2, 1956. This is a must for those using abrasive products in general and this firm's products in particular. *Bay State Abrasive Products Co.*

For free copy circle No. 18 on postcard

Data processing

Data Processing systems are reviewed in an eight page, two-color booklet just released. Literature, illustrated with photographs and color charts, gives brief description of equipment. This includes: the converter, control units, commutator, dc amplifier, time accumulator, digital tape storage units and storage register. *Consolidated Electrodynamics Corp.*

For free copy circle No. 19 on postcard

Dies and tools

Just off the press is a new 20-page color brochure describing "Production Proved" progressive dies and tools. Described and illustrated are case histories on the manufacture of progressive dies, tools, jigs, fixtures, gages and special machinery. *B. Jahn Manufacturing Co.*

For free copy circle No. 20 on postcard

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **7/19/56**

Circle numbers for Free Technical Literature or Information on New Equipment:

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

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NEW YORK 14, N. Y.

Battery catalog

New line of batteries featuring increased life and higher instantaneous discharge rates is illustrated and described in a new catalog. A cutaway drawing shows details of construction, including the heat-resistant polystyrene jar, the support ledges molded into the jar walls from which the battery elements are suspended, and the molded one-piece polystyrene dowels. Other illustrations show firm's positive plate, consisting of a cast lead antimony grid into which rosettes or buttons of pure lead are permanently locked, the negative plate which holds the active material securely in place and the microporous rubber separators which, with the plastic dowels, insulate the positive from the negative plates. *Exide Industrial Div., The Electric Storage Battery Co.*

For free copy circle No. 21 on postcard

Minerals and chemicals

Comprehensive in coverage, 16 page booklet explains origin and formation of the minerals and chemical company and its three wholly-owned subsidiaries. Separate sections tell a "mine-to-finished-product" story of the firm's operations in kaolin, attapulgite, limestone and bauxite, the basic non-metallic minerals from which its products are made. Also included are notable applications for company's materials, a listing and professional resumé of the men who manage and direct the firm, a roster of distributors, and coverage of new facilities with an expression of operating and research philosophy. Nearly 60 illustrations give helpful picture coverage. *Minerals & Chemicals Corp.*

For free copy circle No. 22 on postcard

Industrial trucks

Four page brochure commemorating company's 50th year of industrial truck production has just been released. Literature illustrates world's first industrial truck which was introduced by the company in 1906. In marked contrast, it likewise pictures and describes six new lines of firm's trucks. *Elwell-Parker Electric Co.*

For free copy circle No. 23 on postcard

Single stage pump

Firm's re-designed line of single-stage centrifugal pumps is contained in a new pump bulletin. Designed for general hydraulic services, pumps feature double mechanical shaft seals which eliminate stuffing box maintenance, and prelubricated, sealed ball bearings which require no lubrication throughout their entire service life. Features included in this eight-page, two-color bulletin: typical installation views, cross sectional views, an exploded view of component parts and dimensions. An interchangeability chart is illustrated to show interchangeability of parts throughout the entire line. *Ingersoll-Rand Co.*

For free copy circle No. 24 on postcard

Lathe catalog

Sixty-six models of screw cutting and turret lathes of advanced design, including cabinet models, pedestal base models and floor and bench models, are described in a new catalog. The lathes illustrated and described range in size from the 14 in. swing through a complete line of 12 and 11 in. swing lathes with one in. collet capacity and 1⅜ in. spindle bore, and an enlarged group of ten and nine in. swing lathes with ½ in. collet capacity. In addition to the lathes, the 24 page catalog gives specifications on eight in. shapers. An eight page accessory section lists attachments and accessory equipment. *Logan Engineering Co., Lathe Div.*

For free copy circle No. 25 on postcard

Barrel finishing

Four page bulletin, plus shipsheets, explains precision barrel finishing media and compounds. Following the motto, "It's the shape that counts," it shows hard quality rubber and aluminum oxide burretts in the form of diamonds, rectangles, squares and balls. A complete listing of triangular barrel finishing media and abrasive chips are given. A rundown on all abrasive material made by the firm is given on back page. *Speed-D-Burr Corp.*

For free copy circle No. 26 on postcard

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Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **7/19/56**

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NEW KAYDON THIN-SHELL NEEDLE BEARINGS

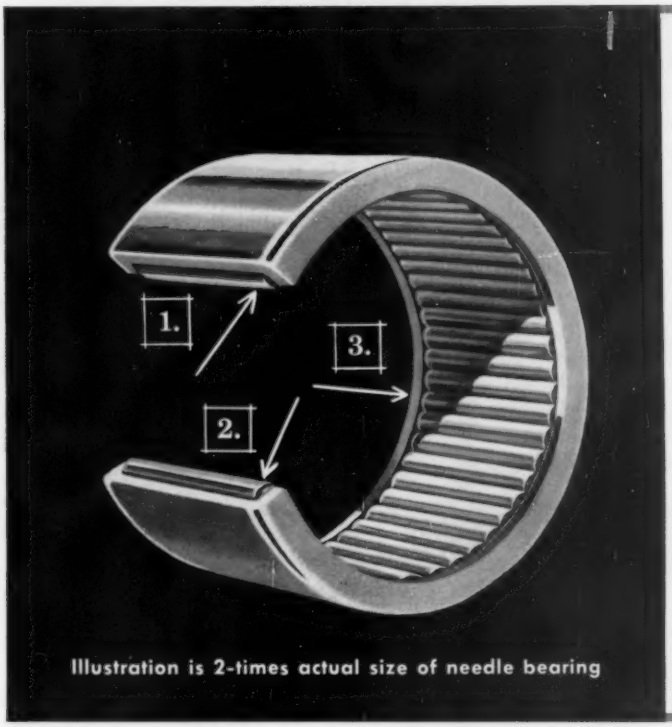
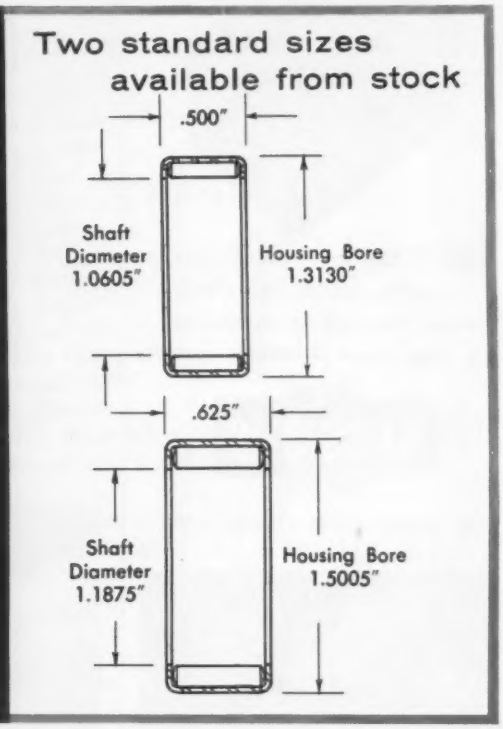


Illustration is 2-times actual size of needle bearing



You get these Kaydon design advantages:

1. **Greater effective length needle rollers for MORE CAPACITY (41% on ½" width)... LONGER LIFE (2.8 times as much on ½" width)**
2. **Simplified construction that SAVES you money**
3. **Pre-packed lubrication that SAVES assembly time**

HERE it is! Kaydon's new thin-shell needle bearing. A bearing that gives you more of everything — more capacity... more economy... *plus longer life* than any other comparable bearing, because of greater effective length of spherical end rollers.

This new bearing is ready for you right now from stock in two standard sizes (illustrated). Other sizes will be available later.

For complete specifications, ask for Data Sheet No. K562—write, call or wire Kaydon of Muskegon.

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

All types of ball and roller bearings — 4" inside diameter to 124" outside diameter... Taper Roller • Roller Thrust • Roller Radial • Bi-Angular Roller • Spherical Roller • Needle Roller • Ball Radial • Ball Thrust Bearings

STAMPINGS
for the FINISHED
PRODUCT

SEE SESSIONS . . . for Metal Specialties, Box & Case Hardware, Stamped Assemblies in a wide range of finishes.

J. H. SESSIONS & SON

290 RIVERSIDE AVENUE • BRISTOL, CONN.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

WELDING: Structures

Trend seen toward welded bridges in rapidly expanding highway system . . . About half the steel used will go into bridges, overpasses . . . Welded building goes up.

While comparatively silent construction goes on of a new welded office building in New York City, a survey shows an upturn in the construction on welded highway bridges.

The survey of state bridge departments, made recently by The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, has revealed a trend toward use of welded bridges in the country's rapidly expanding highway system. Of the 39 state bridge departments responding to the survey, 15, or 38 pct, were using an increasing number of welded highway bridges. Another 13 states or a total of 72 pct were using welding for certain details such as coverplates, diaphrams, shoes, etc. Many of these states were considering adopting completely welded designs for more of their bridges.

Big freeways are increasing use of welded overpasses.

Savings Reported To 20 Pct

Reported savings in steel in typical bridges, resulting from welded design, ranged up to 20 pct. If these savings were extended to the long range Federal road building program, it is said that enough steel could be saved to build a typical highway girder bridge approximately 800 mi long.

The projected highway program of 51 billion dollars will require an estimated 23 million tons of steel. Approximately half of this will go into bridges and overpasses. If welded design were able to save 20 pct of this requirement, the foundation figures saving on bridges alone, would be more than three times as much steel as was used for all highway purposes in 1954.

Meanwhile, at 530 Fifth Avenue in New York City, a new 26-story building is rising, but the usual "rat-a-tat-tat" associated with skyscraper erection is missing.

Small highways use welded bridge to eliminate rail crossing.

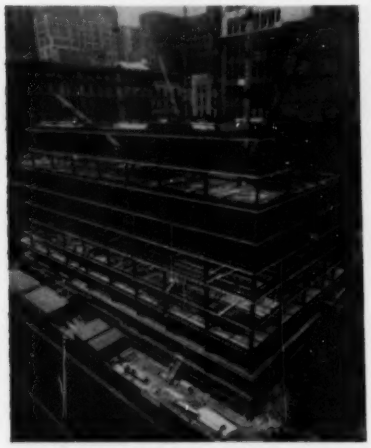
Dreier Structural Steel Co. is shop and field welding the structural framework. Their bid for a welded job was accepted, even

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 129. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

though the structure was originally designed for riveting. The Lincoln Electric Co. reports that this, and one other structure currently being erected in Gotham, mark the first use of welding in the city's large office structures.

The 6000 ton structure will contain 26 stories and a penthouse.



Welded skyscraper frame goes up minus usual chatter.

All major connections on both beams and columns are welded. Field welding totals almost 12 mi in length. Welds are being made with 5/16 in. diam E-6010 and E-6012 electrodes. Some plate girders, weighing 13 to 15 tons apiece, were welded for the interior of the building, forming the ceiling of a 3-story hall.

Finishing:

Selective bypass mechanism automates metal finishing

A new bypass mechanism automatically controls as many as nine or more complete metalfinishing processes on a single anodizing or electroplating machine.

The new mechanism is a part of Hanson-Van Winkle-Munning Co.'s new "dial-a-cycle" system for automatic metalfinishing. This system is controlled from a dial on the carrier arm that moves parts through processing tanks. As unfinished parts are loaded on carrier, machine operator sets dial for processing steps through which load is to move. Automatic con-

WIDE VARIETY OF LIQUIDS HANDLED BY DEMING INDUSTRIAL SOLVENT PUMPS

TYPICAL LIQUIDS HANDLED

Acetone	Hydraulic Oil
Acetone & Amiplene	Isopropyl Ether
Acetate-Acetone	Jet Fuel
Acetate Anhydride	Kerosene
Alkaline Solution	Lanolin
Ammonia	Methyl Ethyl Ketone Solvent
Amylene	Mineral Spirit
Anti-Freeze	Monoethanolamine
Aviation Gasoline	Octo Alcohol
Benzol	Pure Petroleum Naphtha
Benzine	Sea Water
Brines (Light)	Sodium Hydroxide Solution
Butanol	Solvesso
Caustic Soda	Styrene
Coconut Oil	Textile Finish Oil
Diesel Oil	Thinner
Ethanol	Toluene (Crude)
Ethyl Acetate	Toluene (Dry)
Ethyl Alcohol	Vinyl Acetate
Ethyl Ether	Xylene
Fuel Oil	
Hot Condensate	
Hot Paraffin	

Advantages of Deming Fig. 4703 pumps include elimination of priming difficulties as the pumping unit is always submerged; minimum space is required due to vertical construction; universal application for handling both volatile and nonvolatile liquids; no close clearances; less piping required; low maintenance and operating cost. For complete information, write to:

THE DEMING COMPANY
566 BROADWAY • SALEM, OHIO

Says "Dependable Dan"—

In a pinch warehouse steel is a PA's best friend—

For helpful action

RELIANCE STEEL
DIV. DETROIT STEEL CORP.
General Office: Detroit 9, Mich.

PLANTS
CHICAGO 8 . . . . . CAnal 6-2442
CLEVELAND 27 . . . . . VUlcan 3-3600
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HAMDEN, CONN. . . . STate 7-5781

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Processors and Distributors

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READY-TO-USE
SHEET and STRIP
STEEL

COLD ROLLED STRIP
Coils • Cut Lengths • All Tempers
FLAT CR SPRING STEEL*
Soft Annealed
Hard Rolled Untempered
Coils • Cut Lengths
SHEETS
Cold Rolled • Hot Rolled
Hot Rolled Pickled
Galvanized • Long Terne

Experience-Fitted to Your Job

*Stocked only in Detroit

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veying does the rest, lowering parts into prescribed tanks, bypassing others, according to the dial setting.

Heart of the system is a series of limit switches and solenoid-operated setdown flippers that control the carrier action. Different dial settings change "flag" position which subsequently contacts or passes switches and flippers at each tank.

Advantages Cited

Advantages cited by initial users include: 1) cost reduction, since system on one machine can do the same metalfinishing job formerly done by as many as nine machines; 2) reduction of labor costs; 3) improved quality, due to close, automatic control of transfer and immersion periods; and 4) reduction of maintenance costs. It can be used at any metalfinishing installation for anodizing or electroplating.

Operator rotates dial to setting prescribed for raw parts.

The first installation is at the refrigerator plant of a leading appliance manufacturer, where 15 different aluminum parts are automatically anodized. A four-process system is built into the anodizing machine. This permits the company to get two different anodizing treatments and two types of seal, thereby permitting a choice of plain or colored aluminum finishes.

As finishing requirements change, the Dial-A-Cycle machine can be modified easily to meet new specifications and furnish different colors, company says.

Casting:

Electronics now control ingot making

Automation is not only expediting ingot production but it is also reported as making cleaner, more uniform and precise weight ingot.

Recently, Colonial Metals Co., Columbia, Pa., installed an electronically controlled conveyor for pouring its molten aluminum. The unit features a control panel for the adjustment of conveyor speed and automatic pouring. This technique permits production of uniform predetermined weight ingots to customer specifications. Even though automatic pouring eliminates the excessive agitation of metal, assuring a clean, solid ingot free from dross and other inclusions, skimming is still performed.

New Control Lab

The most recent major expansion program undertaken by Colonial Metals Co., is its new, enlarged control laboratory. All products made by Colonial are quality controlled in the laboratory which is said to be equipped with the most modern metallurgical facilities and staffed with highly trained technicians. Ten years ago Colonial started operations with two rotary furnaces with a monthly capacity of approximately 500,000 lb. Today it operates four furnaces in the brass smelting plant and two in the aluminum plant with a combined capacity of 5,000,000 lb per mo.

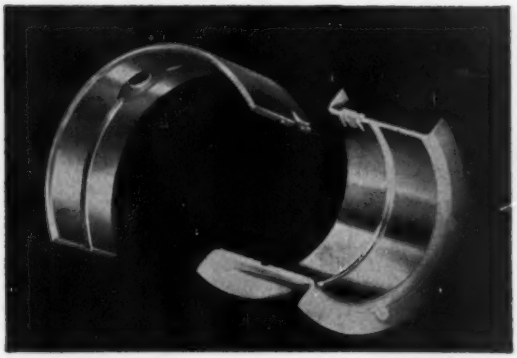
Grinding:

Grinder works to three micron tolerance

How to reduce the area of dispersion around established tolerance in the semi-automatic grinding of roller bearings while keeping the operation automatic, improve product quality, maintain or increase output, and reduce percentage of raw material and finished product rejects are problems that have now been solved.

The answers have been reported

The PROOF of the STEEL is in its PERFORMANCE



DSC CLOSE-GAUGE STRIP is used in these precision sleeve and ring type bearings for car, truck, marine, industrial, farm tractor and certain aircraft engines.

When Your Blue Print Specifies CLOSE-GAUGE

Try DSC STRIP for Size . . .

with job-suited finish and temper for good measure

For most stamped and roll-formed products, the standard thickness tolerance of DSC STRIP is close enough.

For example—in the most popular gauge range, say from .015″ to .099″—the tolerances are from ± .0015″ to ± .0035″ tops, even in maximum widths and heavier gauges.

But when your blueprint specifies "specially restricted" thickness tolerance—you can, if need be, get DSC STRIP as close as ± .0005″ *including crown* in gauges up to .187″. In DSC STRIP rolled for certain sleeve and ring type bearings, the "amount of gauge restriction" is as much as 86.6% closer-than-standard.

For example—5.5″ x .09235″/.09245″: ordered overall tolerance is .001″ against standard overall .0075″ for this gauge and width.

OTHER PRODUCTS WHICH USE DSC CLOSE-GAUGE STRIP*—

- Automatic transmissions
- Refrigeration condensers
- Business machines
- Appliance locking mechanisms
- Fuel injection parts
- Fractional h.p. motor frames

**Including FLAT CR SPRING STEEL*

In standard or restricted thickness tolerance, light or heavy gauge, regular bright or satin finish, low carbon or high—DSC *Stripmanship* is backed by job-performance records. For helpful action, call a DSC Customer "Rep" . . . today?

Customer Satisfaction Is Our Business

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:

Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio., Dayton, Ohio., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., New York, St. Louis, Toledo, Worcester, Mass.

DSC MILL PRODUCTS

Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip • Flat Cold Rolled Carbon Spring Steel
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Welded Wire Fabric

MILLS | PORTSMOUTH, OHIO (Sheets, Rods, Wire)
DETROIT, MICH. and HAMDEN, CONN. (C.R. Strip)

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Calling all STAMPERS

DON'T MISS PMI ANNUAL MEETING
POCONO MANOR, PA., SEPT. 30 – OCT. 4., 1956
For complete details please write
PRESSED METAL INSTITUTE, 3673 Lee Road, Cleveland 20, Ohio

Adv. Courtesy DSC

BUILT TOUGH

FOR TOUGH, FAST LIFTING

Today's tight production schedules demand hoisting equipment that will stand up under daily heavy-duty cycling without attention. This is exactly the performance you get from a Series "700" 'Load Lifter' Electric Hoist. Even though simply designed and constructed for easy maintenance *in the air*, your serviceman will seldom open the covers of this hoist. It is built to step up lifts per hour and step down the cost per lift in your plant.

The Series "700" 'Load Lifter' Electric Hoist was first with safe 24 volts at the pendant control. Capacities now range up to 15 tons. Single and two-speed models. All types of suspension. Ask your "Shaw-Box" Distributor for details or write for Bulletin 410.

'Load Lifter' ® ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' and 'American-Microsen' Industrial Instruments, and Aircraft Products.

as obtained through a new process by the Automatic Temperature Control Co., Inc., Philadelphia.

Essentially, the operating procedure is this: The first four steps remain the same as previously used in the electro-mechanical limit switch system. These are: (1) Hand load two rough ground spherical rollers, (2) engage clutch and start infeed manually, (3) continue rapid manual infeed until sparkling occurs, and (4) release hand feed.

Procedure Changes

Two steps changed to solve the puzzles are: (5) Automatic feed takes over. Firm's differential transformer-measuring head with electrical transmission and control continuously senses amount of work removed from work piece during grinding operation and

Three micron tolerance is held with device on grinder.

stops feed at a few microns above the established grinding dimension. It simultaneously starts timed dress-up. Automatic cut-off at end of dress-up actuates withdrawal and stops spindle motor, and (6) operator manually actuates parts release lever and finished parts drop into box.

Simple, Uncomplicated System

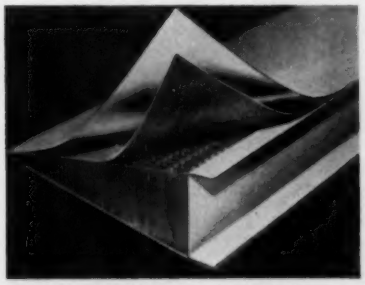
The system is said to be simple and less complicated with the ability to be enlarged for future additions or requirements.

Joining:

Structural adhesive bonding much used on aircraft

Structural adhesive bonding, said to be the first basically new structural fastening method to become available to industry in more than half a century, is being utilized in the construction of virtually every air weapon being added to the arsenals of the Free World. So declares Narmco Resins and Coatings Co., Costa Mesa, Calif.

The company, expresses the basic design concept of adhesive bonding in these words: "Structural aircraft bonding constitutes a



Metal sheets are bonded over honeycomb aircraft structure.

fundamentally new technique for uniting metal to metal as well as a variety of other hard-to-join materials."

By the very nature of this method of adhesion, molecules of the bonded parts are chemically attracted to the molecules of the adhesive. The adhesive bonded joint becomes an integrated, load-bearing unit. In many cases, adhesive joints actually exceed the strength of the metal itself.

Stronger Joints With Adhesives

In the case of lighter metals, it is possible to obtain stronger joints with adhesives than by any known method of mechanical fastening, company says.

Whereas riveting involves high labor costs, produces uneven surfaces, and has low resistance to vibration stresses, adhesive bonding is reported as distributing loads more evenly throughout a structural joint, making for stronger, more durable components.

• THINNESSES TO .002".
• ACCURACY TO ± .0001".

Even in this age of automation, quality is no "push-button" accomplishment. Modern machinery still must be teamed with skilled, experienced craftsmen to achieve the ultimate in quality. That's how it is at WALLINGFORD, and that's why WALLINGFORD Stainless Steel Strip stands up under the scrutiny of our advanced design electronic quality control devices . . . will meet your most rigid requirements for tolerance, analysis, temper, uniformity . . . and will pass the final test of customer usage and approval.
You're invited to visit WALLINGFORD soon to see for yourself the excellence of our facilities and personnel . . . and the quality of our product.

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STEEL CO.
WALLINGFORD, CONN., U.S.A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP • STAINLESS WELDED TUBES AND PIPE

THE FINISHING TOUCH

DO-IT-YOURSELF PLATING

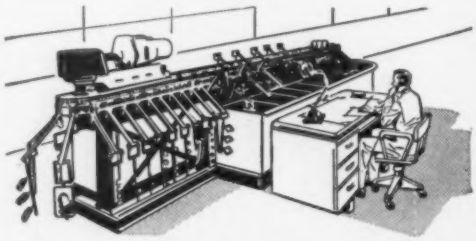
by A. B. HOEFER
Vice-President
FREDERIC B. STEVENS, INC.

Low Cost, Space Saving Machine Will Increase Profits

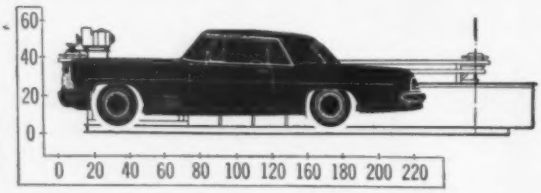
Lack of floor space or initial cost of equipment has turned many a company away from the thought of installing their own automatic plating and processing equipment. If you are in this group, let us tell you what "Little Steve" can do for you.

Last year, we brought out a small automatic plating and processing machine with a very large production capacity. We named it "Little Steve."

"Little Steve's" tank height, including base, measures about 32"—that's only 1½" to 2" higher than the height of the average office desk. In fact, at its highest point (drive end) "Little Steve" is just a little higher than a conventional 4-drawer office file cabinet.



Since it is only seventy-two inches wide, forty-two inches high and built in sections of six feet in length, it offers practically no space problem. Being small in size "Little Steve" means a low initial investment. It will do electroplating, anodizing, enameling, bright dipping—in fact most anything in the immersion processing line.



At its highest point "Little Steve" is even lower than the modern motor car—what's more, it costs less per foot — AND "Little Steve" will pay back its cost in 6 to 24 months.

If you wish to finish parts such as small electrical appliances, door hardware, pistons and plumbing fixtures—and require controlled high production—"Little Steve" should be your answer.

"Little Steve" will give you increased production, automatic control and will pay for itself in from six to twenty-four months. It's easy to operate. Let us give you more details. Write us today. *Frederic B. Stevens, Inc., 1814 Eighteenth Street, Detroit 16, Michigan.*

FREDERIC B. STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

METAL FINISHING EQUIPMENT AND SUPPLIES FROM CASTINGS OR STAMPINGS TO FINISHED PRODUCT

BRANCHES:
Buffalo • Indianapolis • New Haven
Offices in Principal Cities

Handling:

Load cushioning device prevents breakdown

A load cushioning device to prevent hydraulic system breakdowns on a fork-lift truck equipped with a shop adapted scoop attachment has been developed by U. S. Metals Refining Co. to load hard-to-handle copper ingot bars at its Carteret, N. J., plant.

The device effectively protects the main hydraulic circuit of the truck from sudden, severe shocks that may occur when a heavy scoopful of shirting ingots is being lifted, moved or emptied. Formerly, the shocks imperiled the main cylinder piston, and breakdowns were much too frequent and costly. The record of results are: (1) The method reduced the per-ton loading cost by 86 per cent. (2) The hydraulic scoop equipment has been kept in service consistently, and maintenance of the truck is now normal.

When truck scoops heavy ingots, device protects main circuit.

Metallurgy:

Titanium wire making advancements made

New advancements in titanium wire manufacture, developed by James H. Johnston and Edward R. Funk, founders of the newly organized Johnston and Funk Titanium Corp., Wooster, Ohio, produce remarkably clean and ductile wire, alloyed or unalloyed, for

cold heading profits start here

The quality of the cold heading wire you use is the beginning of higher cold heading profits.

That's why so many users specify J&L Cold Heading Wire to help them get the highest quality finished parts at increased production rates, and lowest manufacturing costs.

J&L Cold Heading Wire will meet your exact requirements for:

Precise Chemical Grade and Physical Characteristics
Surface Qualities
Finish
Uniformity

The result—when you specify J&L, you assure the best heading performance. Investigate the profit-making possibilities of J&L Cold Heading Wire today. It's tops in quality—competitive in price.

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH

J&L STEEL

SAMUEL T. WELLMAN *was a horrified onlooker the day everything went wrong with the first open hearth furnace he had helped to build. Troubles reached their climax when the steel spilled out over molds, cars and tracks, welding everything into one mass as it chilled.*

This was in 1868. A year later, Wellman built a 5-ton open hearth furnace for the Bay State Iron Works, at South Boston. He used a much deeper bath and an arrangement of small ports, side by side with thin walls between, which gave a good mixture of gas and air. This furnace worked, and for years after produced ingots of the highest quality. It was America's first commercially successful open hearth furnace. Today, steel's greatest expansion is in open hearth capacity, increasing 36% between 1946-1955, to 110,234,160 net tons.

Great Names in Steel Making #II

Steel men respect success wherever met. But their special recognition is given to men and products that have helped the progress of steel.

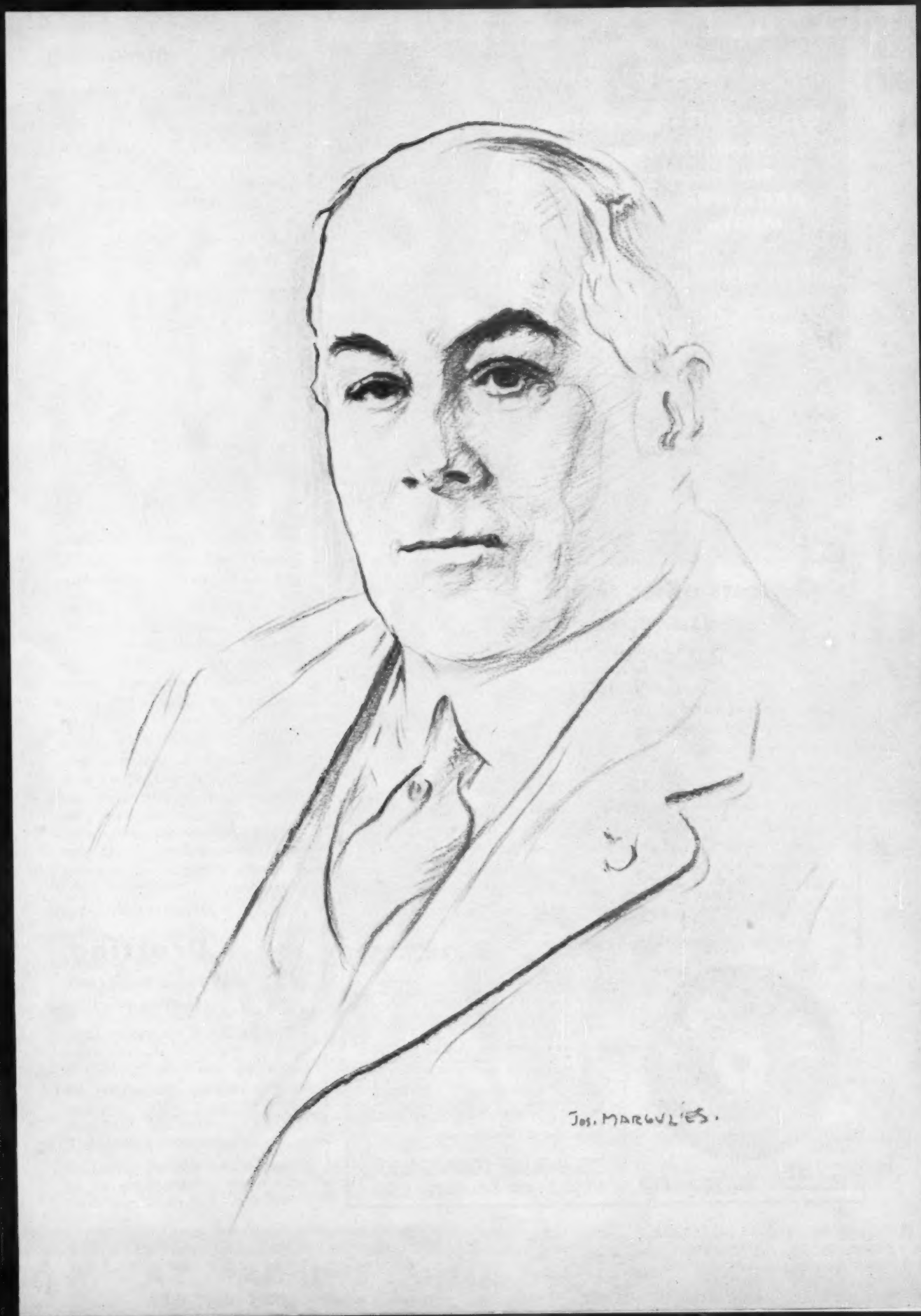
An interesting example of this is the name "Gear Shield." In America there are mills in which the same gears have been lubricated with Gear Shield for 35 and 40 years. In consequence, the name has come to be so synonomous with satisfactory lubrication that other makers frequently refer to their lubricants as "gear shields" even though Gear Shield is the exclusive trade mark and product of The Ironsides Company.

Paralleling developments in open hearth production since Samuel Wellman's first 5-ton furnace, Ironsides rolling mill lubricants have advanced far from the first heavy grease "shield," hand-paddled onto open gears. Encased gears now demand lubricants that can be poured, pumped and jetted. Free-running characteristics have become important in view of the enormous power consumption of today's big mills. At the same time, loads have increased until special Ironsides Shield is now being formulated for pressures as high as 25,000 psi. Shield for the roll necks is still being made of high melting point fatty base material, as it was 60 years ago, but is now formulated with close consideration to its pumpability. Water repellency, a consideration ever since the first rolling of hot steel, is of extreme importance in both roll neck and roller bearing shields.

In consequence, Ironsides engineers have become "custom tailors" of lubricants formulated for the specific conditions and preferences of the individual mill. They are accustomed to working closely with the superintendent, roller and lubrication engineer, on problems involving anything from a pail to tank car shipments.

If you have a problem, they'd like to help you lick it. Just address, or phone, The Ironsides Company, Columbus 16, Ohio.

By the makers of Palmoshield
"the palm tree that grows in Ohio"


Jos. Margulies.

it's the SHAPE that counts!

Speed-D-Burretts*

controlled size and shape **ABRASIVE MEDIA** for PRECISION BARREL FINISHING

Outlasts other media as much as 10 to 1

Controlled grain size Aluminum Oxide bonded firmly with a specially formulated synthetic rubber to allow finishing of precision parts hitherto impossible to barrel finish. Molded and cured to a controlled hardness that assures long life and maximum cushioning yet gives desired cutting, honing or polishing action. New "Burretts" permit abrasive action in the most remote corners and recesses of delicate, precision parts. Will not chip or splinter into odd shapes, thus allowing barrel finishing of complicated precision parts without fear of loading or damage, also eliminating the slow, costly and continuous sizing necessary with other types of media. *May be used with any equipment.*

Write for catalog of prices, sizes, shapes and grits — today!

ALSO ASK FOR CATALOGS ON:

FUTURAMA LINE . . . 3 Custom-Styled Models for large, high production work needs. In popular barrel sizes.

MITY-MITE LINE . . . A unit for every size plant — for high production — or short runs, for large, small or intricate parts.

THE SPACE-MISER . . . A complete barrel finishing shop in one unit. May be installed in a very small work area.

MEDIA and COMPOUNDS . . . Speed-D-Burretts and all other known types and sizes. A complete selection for every barrel finishing requirement.

HANDLING EQUIPMENT . . . All optional handling, media storage, separation and other equipment for complete barrel finishing.

Service is our most important product . . . it does not cost — IT PAYS!

* Pat. Pend.

SPEED-D-BURR CORPORATION PRECISION BARREL FINISHING DESIGNERS • ENGINEERS MANUFACTURERS

SDB-85

THE WORLD'S MOST COMPLETE LINE OF PRECISION BARREL FINISHING EQUIPMENT & SUPPLIES

SPEED-D-BURR CORPORATION
3613-f San Fernando Road, Glendale 4, Calif.

titanium welding and other industrial uses.

Using a late development in technique of vacuum melting, the metallurgists are said to have developed special processing methods for drawing titanium wire from ingots produced in their own vacuum-melting furances.

Their process calls for selected,

Furnace utilizes double melting process to remove contaminants.

blended sponge to be pressed into rounds. The resulting stick is fed into a water-cooled copper crucible where an arc is struck. The melting takes place in a vacuum.

All J & F ingots are double melted. Gases such as hydrogen, nitrogen, and oxygen, whose presence even in minute quantities causes embrittlement, are described as drawn off instantly, resulting in an extremely high level of purity, strength and corrosion resistance.

Drafting:

SAE to merge air, auto drafting practices

The Society of Automotive Engineers have announced undertaking production and publishing of a drafting manual combining the best and most widely accepted drafting practices in the aeronautic and automotive industries.

Agreement of the ground vehicle and aircraft industries on one set of drafting standards is considered

McKAY PRESS FEED AND CUT-UP LINES

WASH THAT DIRTY STRIP
BEFORE SHEARING and BLANKING

The latest development in McKay coil feed lines is this new strip washing machine which thoroughly cleans the strip after it leaves the coil and before it passes through any subsequent feed rolls.

In most stamping plants a sizeable portion of metal finishing costs and quality control problems can be traced to the fact that some coiled steel is dirty and much of this dirt picks up on the rolls of the processing equipment. The dirt which carries over on the blanks may cause scratches in the drawn panels during the forming operations.

In several recent installations McKay has furnished a strip washing machine which utilizes high speed brushes and large volume solvent sprays to thoroughly clean the steel strip at high production speed.

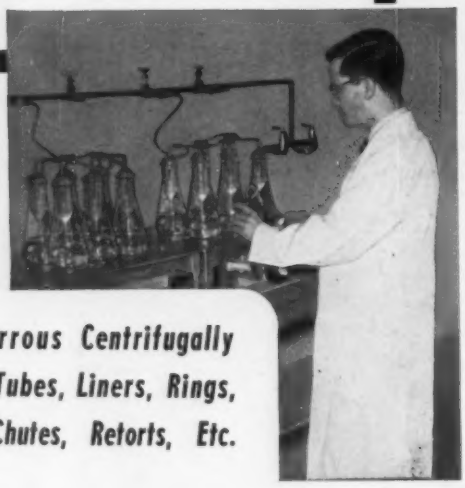
CONSULT McKAY ENGINEERS IF YOU HAVE A PRESS OR SHEAR FEEDING PROBLEM. WE INVITE YOUR INQUIRIES.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

To Rely on SANDUSKY Is to Rely on Research



CHIEF SANDUSKY

Ferrous and Non-Ferrous Centrifugally Cast Rolls, Sleeves, Tubes, Liners, Rings, Bushings, Bearings, Chutes, Retorts, Etc.

There's a great deal more to a centrifugal casting than the finished product itself. It starts in the early stages of development and planning when Chief Sandusky technicians, through research and test experience, are able to specify valuable procedures that will save production expense and man-hours in your operation.

Add to this research the right materials and consistent control and the result is a ferrous or non-ferrous casting which will do its specific job while resisting heat, abrasion, and corrosion as required. An additional service is machining facilities for turning, boring, and drilling.

Rely on Chief Sandusky as an organization of specialists with the answers to your problems with the finest of centrifugal castings.

C. M. Lovsted & Co., Seattle, Wash. • Tynes Bros., Birmingham Ala. • Cordes Bros., San Francisco and Wilmington, Calif.

Chief SANDUSKY CENTRIFUGAL CASTINGS

FERROUS AND NON-FERROUS

SANDUSKY FOUNDRY AND MACHINE CO., Sandusky, Ohio

an important step towards national and international unification of drafting practices.

In 1950 the SAE Automotive Drafting Standards Committee and the SAE Aeronautical Drafting Committee prepared a common standard on abbrevations of terms used on engineering drawings. This worked out so well that in 1953 a Joint Sub-Committee undertook the ambitious task of writing a common standard of dimensioning and tolerancing. This standard was completed in 1954.

Alloys:

Aluminum-iron alloy extends valve life

Applying a protective aluminum-iron alloy layer to the working faces of internal-combustion-engine valves is said to extend their life from two to three times that of a conventional valve made of the same material. Increased oxidation resistance provided by the alloy layer results primarily from the formation of aluminum and complex iron, aluminum oxides that provide a protective film which inhibits further attack on the base metal.

Problems Involved

The problems involved in experimentation and research to find an economical way of applying this coating were recently disclosed to engineers attending the semiannual meeting of The American Society of Mechanical Engineers. The paper was prepared by J. A. Newton and M. D. Braid, Valve Division, Thompson Products, Inc., Cleveland.

After various uneconomical trial arrangements involving heating the valve in a fluxing salt, dipping it in molten aluminum and passing it through an air blast to remove the excess, a final process design was evolved that produces quality parts on an economical basis. It consists of degreasing, induction preheating to 400°F, aluminum spraying, induction post-heating to 1400°F to form the alloy film, and final inspection.

Materials:

Steel wire rope clips have strong grip

Wire rope clips are drop-forged from high-grade forging steel and are said to provide positive "grips of steel" for tough, heavy-duty service. Introduced by the Wire Rope Div., American Chain & Cable Co., Inc., Wilkes-Barre, Pa., clips are pre-packaged for user and distributor convenience.

Clip's base channel is designed to grip without damage.

Engineered for safety, the base channel is shaped to hold the wire rope securely without damage to individual strands. They can be applied on the job and, according to the manufacturer, no vise or other special tools are required.

Maintenance:

Heat resistant paint resists up to 600°F

For use on surfaces subjected to temperatures up to 600°F, a new quick-drying heat resistant paint has been announced.

Made by Speco, Inc., Cleveland, it air dries to a tough, bright finish in less than two hr. In addition, it is reputed to achieve maximum effectiveness without special baking and to have no objectionable odor during application. It can, as a result, be used in any quantities without interrupting regular work schedules.

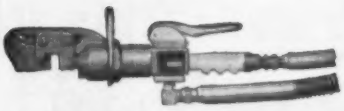
NEW DESIGN

MANCO Hydraulic Guillotine®

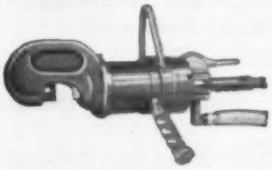
WIRE AND ROD CUTTERS

Big Capacity

FAST · EASY TO USE



MODEL MC 210 Capacity ½" High speed . . . ½ second per cut for steel rod to ½". Full swivel action.



MODEL MC 35 Capacity 1" Cuts high carbon material including reinforcing rod and heat treated chain to 1" diameter in 1¼ seconds per cut.

MODEL MC 65 Capacity 1¼" Cuts 1¼" diameter steel in 2 seconds per cut. Can be modified to cut 1⅝" diameter aluminum.

Big Time and Money Saver for Rod Mills and Users of Wire and Rod

Ideal for production cutting, trimming off cobbled ends, taking test samples and splitting bundles on docks.

Manco has completely redesigned the Guillotine line of wire and rod cutters now used by major rod mills throughout the world. These new Manco Guillotine units give high efficiency, heavy duty performance, with a 75% slash in tool maintenance costs.

New Interchangeable Blade and Anvil

Interchangeable blade and anvil means wear points can be reversed for virtually double life. Three blade styles for various cutting requirements. There is a new simplified valve design with hardened and ground parts for longer life. Also, new Meehanite piston with large bearing surface and a new piston seal assembly that permits quick replacement.

These Guillotine units powered by Manco Hi-Thrust Electric Hydraulic Pumps

Write for Complete Information

IA-7C

WRITE FOR CATALOG

Important Note: Also ask about trade-in offer on old model 200 HV-2L, 20 HV-1 and 21 HV-2L.

MANCO MFG. CO., Bradley, Illinois

Please send:

☐ Catalog of new Guillotine Wire and Rod Cutters.

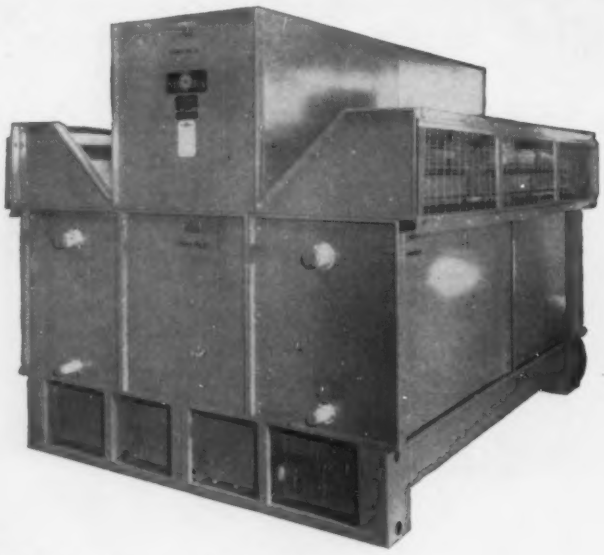
☐ Trade-in information on Guillotine model(s)_____

_____

Name _____

Firm _____

City _____ Zone____ State_____



NIAGARA SECTIONAL
***Aero* HEAT EXCHANGER**
gives close temperature control,
saves you ***LABOR,*** *Power, Water*

- **Because the new design improves the heat transfer to the out-door air by evaporation.**
- **Because new features keep your equipment working for long life with "new plant" efficiency...always full capacity.**
- **Because you save 95% of cooling water cost.**

You get faster, more accurate cooling of industrial fluids to specified temperatures.

You improve your quality of production by removing heat at the rate of input.

You save labor in upkeep. With full access to all interior parts and piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 7,000,000 to 18,000,000 Btu/hr. No other heat exchange method gives you so much saving in money and convenience.

Write for Niagara Bulletin 132. Ask for the full story of how you can save expense in your plant and improve your product's quality.

NIAGARA BLOWER COMPANY
Dept. I-A, 405 Lexington Avenue
NEW YORK 17, N. Y.
District Engineers in Principal Cities

NIAGARA *Over 40 Years' Service in Industrial Air Engineering*

According to the manufacturer, it resists extreme temperature variations, smoke, moisture, fumes, mild industrial acids and alkalis. It is recommended for protecting steam lines, vats, separators, exhaust manifolds, stacks, tanks, ovens and heat lines.

Applied like normal paint, it dries to a tough, bright finish.

Applied by either brush or spray, it covers approximately 500 sq ft per gal. It is available in qt and gal cans, 5 gal pails, 30 and 55 gal drums.

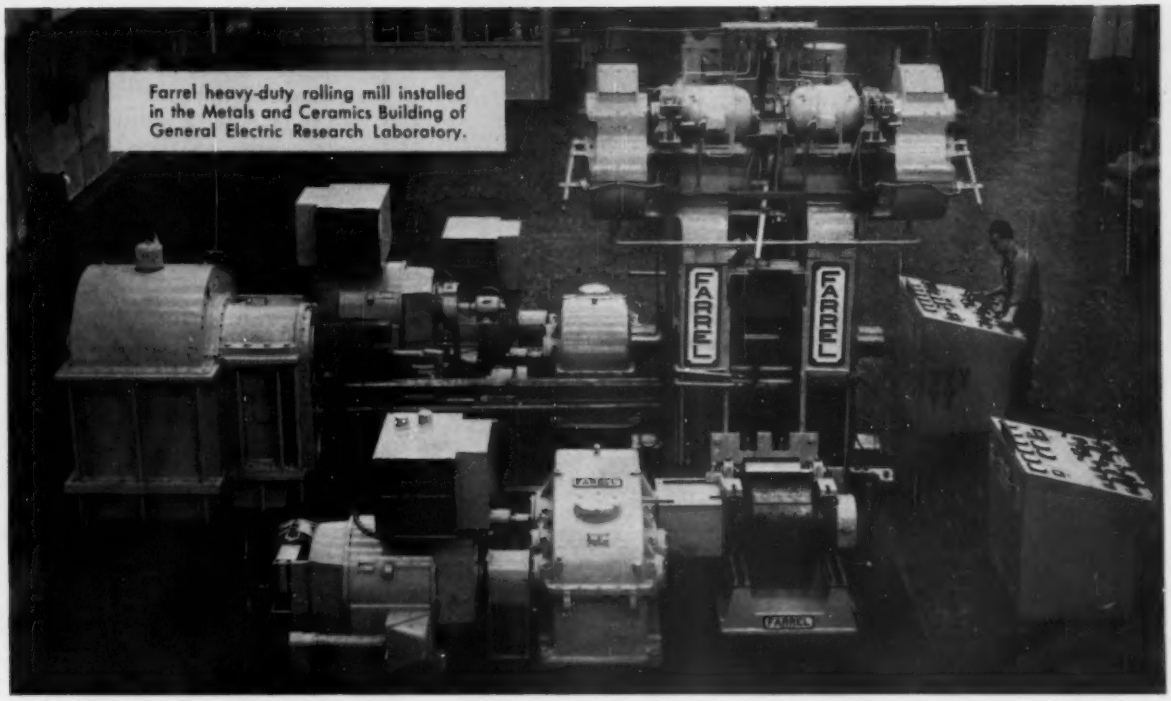
Controls:

Remote control of crane claims high returns

Better materials handling shares the spotlight with increased operator safety for this operation. Executives were faced with a two-pronged problem of cost reduction and handling of tough, heavy and sometimes hazardous jobs.

Remote control of hoist is done through two reels.

Materials handling costs in one steel warehouse were very high. They were expected to be higher



Farrel heavy-duty rolling mill installed in the Metals and Ceramics Building of General Electric Research Laboratory.

This hot or cold reversing mill was designed for rolling super alloys

The Farrel® mill illustrated above was specially designed for rolling a variety of the super alloys currently in demand, as well as even tougher metals which may be developed.

On trial runs it has given a good account of itself, with close gauge control. Factored for extreme rigidity and strength, the mill has a number of features which give it unusual versatility. A few of these are described at the right.

A Farrel mill can be built to meet your specific needs. Just tell us your requirements, and one of our engineers will be glad to discuss your problem with you.

In the meantime, send for a copy of bulletin 273. This 36-page book illustrates the broad line of Farrel rolling mills.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago,
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Farrel-Birmingham®

FARREL METAL WORKING MACHINERY: Rolls • Rolling Mills • Slab, Rod and Strip Handling Equipment • Roller Tables • Rod Coilers • Slitters • Gears • Gear Drives of Any Capacity • Mill Pinions • Pinion Stands • Universal Mill Spindles • Flexible Couplings • Roll Grinding Machines • Roll Calipers • Hydraulic Presses for Extruding, Forming, Drawing, Forging, Trimming, Hobbing, Straightening and Bending.

MILL FEATURES

Designed to operate as a 2-, 3- or 4-high reversing mill, for either hot or cold rolling, the entire unit is controlled from either of two pulpits. Power is supplied through a Farrel combination drive and pinion stand. Two direct-current motors, electrically synchronized, drive the rolls. Speed adjustment is by stepless speed variators; no matching of roll diameters is required.

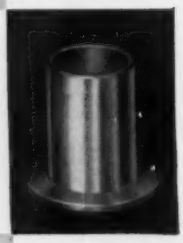
For operation as a 4-high mill, a pair of 3" or 6" diameter by 16" face work rolls are used; backup rolls are 21" diameter. For 2-high operation, rolls up to 24" diameter can be accommodated. For 3-high operation, either a 3" or 6" work roll can be used. In the 4-high arrangement, provision is made for driving either the work rolls or backup rolls.

The mill has high-speed screwdown to facilitate roll changing and for roughing; and slow-speed screwdown for fine adjustment when finish rolling.

For roll changing, a porter bar is supplied for the work rolls, and an integral roll sled for the backup rolls. Tension winders provide 20,000 lbs. tension.

THESE NEW

Bunting®



BEARINGS
MAY SOLVE YOUR
COST PROBLEM

A more complete, advantageous bearing service than has heretofore existed came into being when Bunting added self-lubricating sintered powdered Bronze Bearings to the long established line of Bunting Cast Bronze Bearings and Bars. These new Bunting sintered bronze plain, flange and thrust bearings and bars are made to Bunting's traditional high standards of quality and precision. They embody knowledge gained in long and varied experience in manufacturing Bronze Bearings for all applications in the mechanical industry. They fully meet modern requirements.

Bunting Sintered Bronze products will be manufactured and distributed in the same responsible manner that has established Bunting leadership in the field of Cast Bronze Bearings. Use them with confidence.

BOTH Bunting Cast Bronze and Bunting oil filled, self-lubricating sintered powdered Bronze Bearings and Bars are available to you through your nearest Bunting Distributor. He has in stock all sizes for your immediate needs. Ask him or write for complete lists and dimensional data on Bunting Cast Bronze and Bunting Sintered Bronze Bearings.

Bunting®

BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS
OF CAST BRONZE AND POWDERED METAL

The Bunting Brass and Bronze Company, Toledo 1, Ohio
Branches in Principal Cities • Distributors Everywhere

yet after contemplated purchase of an expensive cab crane. Something had to be done in order to cut operating costs on these operations without sacrifice to operator safety, they said.

Lack of definite aisles and other general floor conditions required the operator to stay away from load when in motion. Safe movement of heavy-duty angle iron by their top-running trolley crane, as a consequence, was time consuming.

Solution Found

Due to cost considerations, management decided not to purchase a new cab crane. Instead, engineers of the Wright Hoist Div., American Chain & Cable Co., Inc., York, Pa., manufacturers of the trolley crane, were consulted and called upon to solve the difficulties. Remote control of the five ton crane, providing added safety features for the operator, was suggested.

A unique method of suspending the push button station control from the outrigger channel, independent of the trolley, was designed. The desired effect was accomplished through two reels, one on each crane side.

In addition, a four inch "I" beam was mounted under the outrigger where a small trolley is used to allow for movement of the push button station. For spans of 35 ft or more in length, a reversed catenary curve can be built into the "I" beam to compensate for cable reel pull. This allows push button station to remain where the operator leaves it and not be pulled to the center of the span.

Power:

Steam turbine generator nearing completion

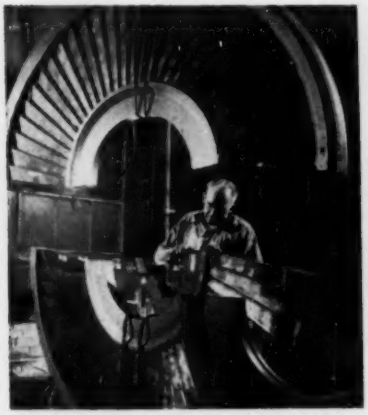
A 156 to 250 kilowatt steam turbine-generator unit for Southern California Edison Co.'s Alamitos power station near Long Beach, Calif., is nearing completion at General Electric Co.'s Large Steam Turbine-Generator Department plant in Schenectady, N. Y.

A diaphragm is placed in the turbine shell between the last two

rows of moving buckets. Nozzle diaphragms are used to change the direction of the steam in the turbine after it passes through each of the rows of moving buckets.

Steam Enters At 1800 Psi

A tandem-compound, triple-flow, reheat type steam turbine will drive the 3600 rpm generator. Steam enters the turbine at 1800 psi at 1000°F.



Worker removes high spot inside rim of turbine's diaphram.

This power generating machine is described as being capable of satisfying the average yearly electrical needs of over 225,000 Californians. When the unit is placed in operation this year, it will join a similarly rated G-E powermaker and increase the Alamitos station's capacity to 312,500 kilowatts.

Alloys:

Copper-zirconium alloy has high conductivity

Possessing high electrical conductivity and good strength-retention at elevated temperatures, a copper-zirconium alloy has been developed by technologists at Battelle Institute, Columbus, Ohio. It is suitable for electric motor commutators serving at temperatures above 500°F and under conditions where strength is required. This alloy is the result of research for the Nippert Electric Products Co., Columbus.

Electrical conductivity of the

The "PLANOBOT" - another example of PLANET'S Automation Engineering

The "PLANOBOT", which served cokes to visitors at Planet's booth, was a hit at the Foundry Show. It picked up, opened and poured the coke and then returned the bottle automatically. It was designed by Planet for an automotive manufacturer to transfer die castings automatically from machine die to the next operation.

This machine has a timing plate which controls any desired cycle combination of movements . . . the grasping device on the horizontal arm opens and closes and rotates 360 degrees and the arm will extend or retract, raise and lower, and rotate 360 degrees. Adjustments can be made in a matter of minutes to set the "PLANOBOT" for an entirely different cycle of operations. It is truly a Universal Transfer Device.

The "PLANOBOT" is just one example of Planet Corporation's engineering and designing skill. Planet engineers are experienced in applying automation to casting handling systems, cooling conveyor systems, briquetting systems, core sand systems, molding sand systems, and shell molding systems. Let them help solve your problems. Write or call today for a Planet Sales Engineer. There's no obligation, of course.

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1825 SUNSET AVENUE
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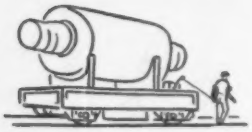
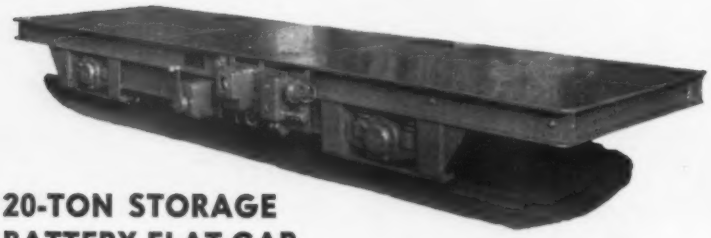
- CONVEYORS
- ENGINEERED SYSTEMS
- FOUNDRY EQUIPMENT
- AUTOMATION
- STEEL FABRICATION

IT PAYS TO PLAN WITH PLANET

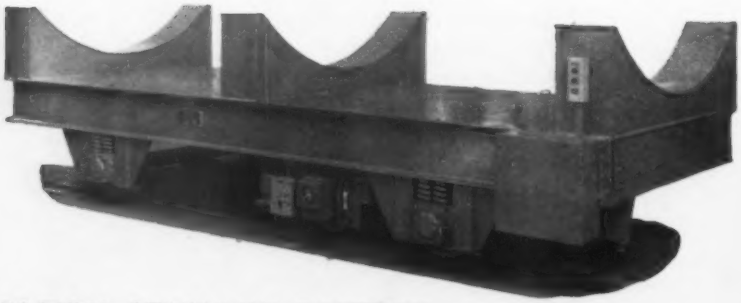
ATLAS SAFETY TYPE "SHORT HAUL" TRANSFERS



Atlas Safety-Type Transfers provide safe, low-cost service. Available with gas or diesel-electric, cable reel, or storage battery power. Atlas Transfers handle any type of load . . . and the heavier the load, the greater the savings.



20-TON STORAGE BATTERY FLAT CAR



20-TON STORAGE BATTERY WITH CRADLE FOR PIPE

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

alloy is 95.8 pct of that of the copper standard. Strength loss under load is said to be exceptionally low by commutator alloy standards.

Other Properties

Other properties of the copper-zirconium alloy, which is now in commercial production, include good machinability, ability to develop and maintain a commutator film, and strength increase with notching. Machinability of the alloy, which contains 0.25 pct zirconium, appears to be comparable to that of various copper-silver alloys used in commutators. Reports of commutator performance tests, both at sea level and at high altitudes, indicate that brush life with the new alloy is at least equal to that with similar commutators made from silver-bearing copper and chromium-copper alloys. Notched and unnotched specimens of the new alloy exhibited rupture strengths on the order of 32,000 to 41,000 psi in 100 and 500 hr creep-rupture experiments conducted at 550°F.

Inspection:

Calibrating machine used with instrument shunts

A new special high current multi-contact calibrating machine has been designed and recently installed by Ram Meter, Inc., Detroit, for their own use in calibrating their instrument shunts, of which

Galvanometer indicates variations of less than 1/10 of 1 pct.

they manufacture a complete line from 15 to 10,000 amp.

Not for sale on the general market, this equipment utilizes a double Kelvin bridge circuit and is used in connection with a sensitive Galvanometer which gives indications of less than 1/10 of one pct variations. This new test equipment calibrates shunts correctly with a tolerance of one pct or less from the established rating. Ram shunts provide uniform current distribution with no spot overheating. Errors due to heat are offset by the use of resistance strips that have negligible temperature coefficient and thermo-electric effect.

Construction:

Fireproof roof system utilizes steel

Incorporating a lightweight steel base, a new fireproof roof system consists of vermiculite insulating concrete poured-in-place to desired thickness on vented corrugated steel sheets. The latter are fastened to steel joists fire-protected on the under side.

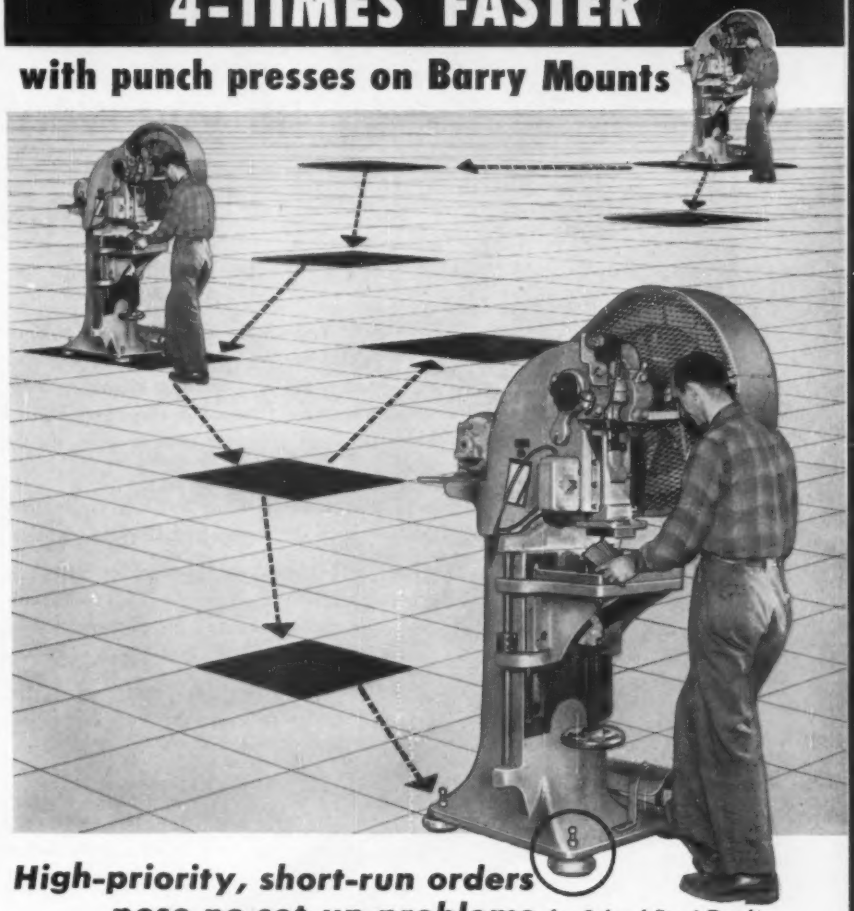
On the Great Southern Shoppers Mart nearing completion at Bridgeville, Pa., one of the first major installations, the saving in insurance premiums over a 10-year period are predicted at $116,000 compared with the fire-retardant type of deck first considered.

After tacking down sheets, vermiculite concrete is poured.

Other advantages are rapid installation, lightweight, economy, permanence, and design flexibility to meet a range of joist spacings

INLAND STEEL PRODUCTS moves into special production 4-TIMES FASTER

with punch presses on Barry Mounts



High-priority, short-run orders pose no set-up problems for Inland Steel Products Company, of Milwaukee. In ½-hour or less, punch presses equipped with Barry Machinery Mounts are moved right where they are needed —often to an entirely different department—and are in full production.

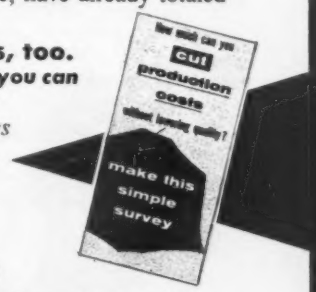
Efficient organization of production lines, plus mobilization with Barry Mounts, enables this famous fabricator of sheet-metal building products to handle special orders profitably—even for runs of only a few hours. And savings, in installation cost alone, have already totaled over $300 per machine.

Barry Mounts Can Boost YOUR Profits, too.

Barry Survey Chart SB-756 shows how you can

Ask for FREE check chart

- *make machine layouts flexible*
- *reduce down-time during tool changes*
- *eliminate "in-line" maintenance*
- *avoid need for machine duplication*
- *gain higher operating speeds*
- *stop building-borne vibration*
- *cut down noise*
- *decrease rejects from precision tools*



Write now — and learn how you can gain these important savings.

BARRY CONTROLS INCORPORATED

BARRY B MOUNT

SOLD THRU INDUSTRIAL DISTRIBUTORS

795 PLEASANT STREET, WATERTOWN 72, MASSACHUSETTS

weldments as you want them...

For half a century, Kirk & Blum skilled craftsmen have been saving time and money for outstanding manufacturers. Whatever the weldment required, these experienced artisans know the most efficient technique to do the job accurately and quickly.

This know-how, plus modern Kirk & Blum equipment, assures high quality sheet steel and alloy fabrication.

Fabrication of guards, tanks, machine bases . . . all types of semi-finished and finished weldments . . . are available from Kirk & Blum to your exact needs.

Let K & B bring your drawings to life. Write for booklet, or send your prints for prompt quotation.

THE KIRK & BLUM MFG. CO.
3200 Forrer Street
Cincinnati 9, Ohio

KIRK & BLUM
SHEET & PLATE FABRICATION

and requirements of insulation.

The Great Southern deck covers a total area of 291,000 sq ft, including the marquees. There are five buildings comprising some 60 stores grouped to form a hollow rectangle around a central parking area. The property covers 35 acres about 11 miles from downtown Pittsburgh.

One To Six Mix

The vermiculite concrete is a 1:6 mix (1 part Portland cement to 6 parts vermiculite aggregate by volume). It is reinforced with galvanized wire reinforcing mesh, and varies from two to three in. in thickness over the top of the corrugations, depending on the design section of the deck. Ceilings are suspended diamond mesh metal lath, fireproofed with three-fourths of an inch of vermiculite plaster.

This assembly has a three-hour fire rating. The two-inch thickness of concrete and mesh weighs only 5½ lb per sq ft. Total weight, including steel form, suspended ceiling and built-up roofing is 17½ lb per sq ft.

Main Supporting Beams

The main supporting steel is WF beams on steel columns 25 ft on centers. Welded to the beams are bar joists spaced 37½ in. on centers and spanning 20 to 25 ft. Where the span is greater, long span joists were used spaced 36½ in. on centers and spanning up to 60 ft.

Corrugated Sheet Steel

The corrugated steel forming was precut. A typical sheet is 9 ft 5 in. long and 26 in. wide. Cover width is 24 in. with a 1 in. overlap on each side. Sheets were placed at right angles to bar joists and anchored with side clips placed about 12 in. on centers on alternate sides of the joist. Where the sheets overlap at the ends, a clip was placed on each side of the joist, and a third clip at intervening joists.

After a section had been placed, the workmen went back and inserted vent clips on the lip of each sheet between each joint.

Surfacing:

Spun mineral wool felt insulates to 600°F

Use of high density, spun mineral wool felt insulation is said to reduce material and labor costs in insulation of high temperature surfaces up to 600°F. Available in relatively large standard sizes, it is flexible enough to conform to curved surfaces without cutting or scoring, yet is rigid enough to support itself. Manufactured by Baldwin-Hill Co., Trenton, N. J., in a range of densities, material is

Spun mineral wool is trowelled to a smooth surface.

easily cut to conform to irregular shapes and is simply applied.

Drying smooth and white when finish trowelled, it is said to provide a clean attractive surface.

Atomic Energy:

Revised stable isotope Inventory issued

A revised stable isotope inventory and price list is available from Oak Ridge National Laboratory, which Union Carbide and Carbon Corp. operates for the U. S. Atomic Energy Commission. Changes in this catalog were made in accordance with the new distribution policy set forth by the A.E.C. earlier this year.

Under the old distribution policy, electromagnetically enriched iso-

FOR IMPROVED FURNACE CIRCULATION

Through the use of a THERMAL High Velocity burner production for a given size furnace can be substantially increased or furnace size for a given rate or production can be decreased.

high velocity burners by THERMAL

(1) Combustion 90% completed within the burner itself.

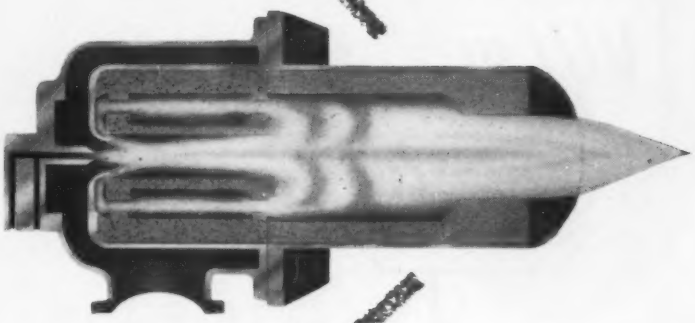
(2) Convection is a predominant means of heat transfer.

(3) High exit velocities (300 to 500 ft/sec) of products of combustion.

(4) Identical flame characteristics with oil, gas or combination gas-oil burner.

(5) Heat release rates of 10,000,000 BTU/hr/cu ft of combustion space.

(6) Flame length, regardless of fuel used is seldom more than one foot in length.



By proper utilization of the THERMAL burner characteristics of high velocity, high temperature, non-luminous flame, remarkable results have been obtained in furnaces, kilns, ovens and heat exchange equipment of all types. Let us analyze the effects possible in your facilities or describe the specialized heat equipment designed and built by THERMAL. Write for Bulletin No. 108.

Thermal Products & Services

Gas, Oil & Combination Burners • Heat Exchangers • Air Heaters • Submerged Combustion • Combustion & Heat Transfer Equipment

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Vulcan's Gage & Die Steel

Now... save time and money on smaller tools and dies with Vulcan's new VULground gage and die steels—by eliminating initial tool steel finishing costs. This precision-ground, excellently finished flat stock comes ready for application.

VULground is now available in oil hardening and air hardening tool steels—in flats and squares, standard 18 inch and 36 inch lengths, in a wide variety of thicknesses and widths.

Vulcan's reputation for highest quality goes with every shipment of VULground gage and die steel. Depend on it *regularly*. Send now for descriptive folder and prices.

VULCAN TOOL STEELS
HKP

Vulcan Crucible Steel Division

H. K. Porter Company, Inc.

Aliquippa, Pennsylvania

Offices and warehouses in principal cities

topes were only lent to users in the U. S. Although this loan procedure limited their uses, it provided isotopes at very reasonable cost to the user. Also, many of the isotopes were returned to stock after expiration of the loan period and could be made available to new users. Because it would be impractical to lend isotopes to certain foreign users, a limited sales policy has been in effect for the past two years. Revised procedures provide for the outright sale of many enriched stable isotopes to all domestic users, as well as to certain foreign users, and permits the loan of samples of rare and expensive items under certain conditions. Moreover, neither domestic nor foreign applicants will be required to file and obtain A.E.C. approval before purchasing the materials.

Coating:

Teflon-base coating is anti-static

A new anti-static coating for industrial equipment, utilizes Teflon as the base material, retaining all its characteristics but reverses the electrical insulation feature to create electrical conduction. Thus, it is reported now possible to achieve an anti-stick, dry-lubricated, chemically inert surface, that is anti-static as well.

A variety of practical uses have already been found for the material by the makers, General Plastics Corp., Paterson, N. J. On conveying equipment, the anti-static feature permits powders to flow freely, reducing costly cleanup time.

Can Withstand 700°F

The electrical resistance across this new coating, when applied in a four mil film, is approximately one ohm. Surfaces can be coated in multiples of one-half mil up to ten mils, on any type metal or other materials which can withstand a temperature of 700°F, required for the baking process. As a result, electrically conductive surfaces can also be applied over an insulating base, such as glass, ceramics and porcelain.

Materials:

Chassis grease additive will be studied

Thirty vehicles will travel a total of 1,500,000 to 2,225,000 mi. in a road test, conducted by Southwest Research Institute, San Antonio, Texas, for Climax Molybdenum Co., for evaluating effect of incorporating molybdenum-sulfide additive in chassis grease.

The program, expected to require 12 mo., will consist of road tests to determine effectiveness of chassis grease in various vehicles under normal operating conditions. Half the vehicles of each type used in the test will be lubricated with commercial chassis grease, the other half with the same chassis grease in which three pct. Moly-Sulfide Pure has been dispersed. Wear will be determined by before-and-after weight comparisons, dimensional measurements and surface inspection of key parts. In the final analysis, these data will be considered in conjunction with service logs and driver reports on squeaks, ease of steering, and other pertinent observations.

Standards:

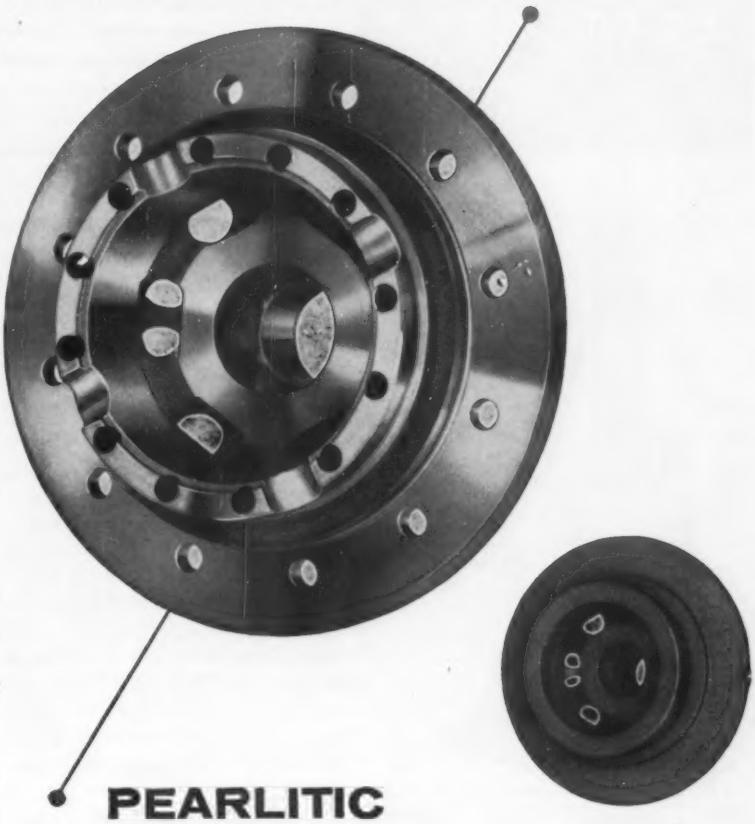
Commerce Dept. to revise air conditioning advice

Proposed revision of simplified practice recommendations for pipes, ducts and fittings for warm-air heating and air conditioning has been submitted to producers, distributors and users for review and acceptance by the Commodity Standards Div., Office of Technical Services, U. S. Department of Commerce.

Recommendation consists of simplified listing of pipes, ducts and fittings for gravity, forced-air, perimeter and extended plenum systems. It was first issued in 1945, revised in 1949, amended in 1952, and again revised in 1954.

Proposed revision, submitted by the Air Distribution Institute, reflects changing trends in warm-air heating equipment from gravity to forced-air furnaces. Some nomenclature changes have been made.

MACHINABILITY INDEX 80-90*



PEARLITIC MALLEABLE CASTINGS

* B1112 STEEL = 100

Low machinability index of 80-90 (B 1112 steel = 100) is probably reason enough to warrant serious consideration for your product.

But pearlitic malleable castings—from National—don't stop there. They have great ultimate strength . . . resist wear under heavy loads at high speeds . . . make excellent non-seizing bearings . . . can be air or liquid-quenched . . . can be smooth-finished.

Don't overlook the advantages of pearlitic malleable. For pearlitic malleable castings—from National—can often reduce manufacturing costs, weight and assembly time . . . can increase the sales potential of your product.

AA-1806

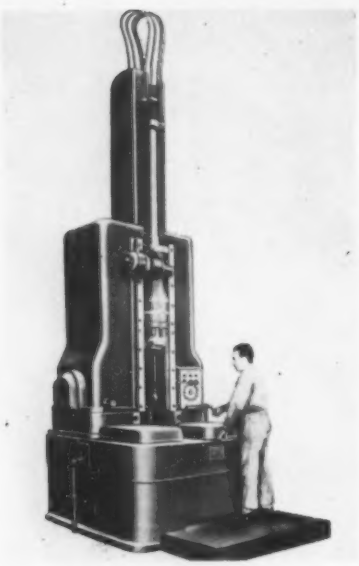
NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

Cleveland 6, Ohio

The Nation's largest independent producer of malleable and pearlitic malleable

NEW EQUIPMENT

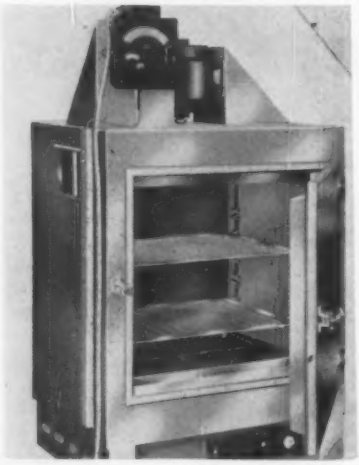
New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 129 or 130.



Precision forging process offers automatic production

Rapid production, automatic control and high precision are reported as major qualities of a new forging machine line. Each machine has four forging hammers equally spaced around the work piece. These hammers strike 540 simultaneous blows per minute with a force of 132 ton or more. Work is chuck fed. Vertical movement and chuck rotation are automatically controlled and the working position of the hammers is automatically adjusted so that up to eight different cross sections can be forged on one piece in a single operation. Outside dimensions are controlled by stop settings on index drums. Tapers and curvatures are regulated by template followers. Inside contours are formed around mechanically positioned mandrils. Work may be done hot or cold, on ferrous or nonferrous materials, on solid or tubular stock, with or without mandrel. Tolerances of 0.004 in. are possible in hot working, and up to 0.0004 in. cold. By forging to such limits, manufacturer says inside and outside machining can be drastically reduced and often eliminated entirely. Other advantages given: material savings, inexpensive tools, short setup time, no vibrations. Manufactured by *Gesellschaft fur Fertigungstechnik und Maschinenbau m.b.H.* Handled in U. S. by *Girard Associates.*

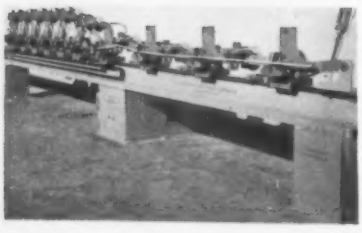
For more data circle No. 27 on postcard, p. 129



Fast, uniform results given by recirculating oven

Uniform air temperatures and faster results equivalent to higher priced conventional mechanical convection ovens are reproduced by a low cost recirculating vertical air flow oven, according to the manufacturer. It has easy to read, direct visual indication of oven temperatures to 650°F. Higher wattage permits quick attainment of operating temperatures. Multibladed turbo blower, dynamically balanced, powered by heavy duty ball bearing motor, circulates tempered air down back of plenum chamber over heater bank and vertically throughout working chamber, giving definite directed air flow. Adjustable alloy baffle permits control of air movements when desired. Power selector switch, wired into electrical circuit, coupled with U. L. Approved automatic indicating and controlling thermostat, gives fine temperature control throughout entire range at low, medium or high temperatures. Interior construction is of stainless steel, including inside face of door. Exterior is heavy reinforced oven steel. *Blue M Electric Co.*

For more data circle No. 28 on postcard, p. 129



Presto: 30 ft rod to web in less than minute

This improved bar joist web bending machine is identified as the result of demand and assistance from principal fabricators to attain the engineering and trade requirements necessary to meet present and future competition. The standard machine will bend a 30 ft rod to any conventional size web in less than a minute. Longer machines are available. New model has a 32 second operating cycle. *Eidal Mfg. Co.*

For more data circle No. 29 on postcard, p. 129

Hi-Qua-Led...A NEW STEEL MATERIAL

Addition of Lead to Steel for Circular Forgings Lends Cost-Reducing Machinability Without Changing Basic Steel Properties

Since the late 1930's steel manufacturers have searched for a satisfactory method of adding lead to steel for use in circular forgings. Large segregates of lead have been the most important problems to be solved. Now, however, ALCO Products, Inc. has developed a new process which overcomes this obstacle by distributing the lead evenly throughout the steel in a finely disseminated state. It is being marketed under the trade name, "Hi-Qua-Led Steel," in ALCO's rolled forgings, rings and gear blanks.

Development of Hi-Qua-Led

ALCO, in 1954, began a search for a lead-addition method that would cover the entire size range of the company's forged rings and gear blanks – up to 145-inch OD. After initial trials, ingots were produced from 12-in. to 36-in. diameter with lead recoveries as high as 85 per cent. When the ingot sections were forged and rolled into rings, the rings were sectioned and studied for segregation, impact, bend, tensile and other properties. They were uniformly good and lead was distributed as submicroscopic particles. Both ingot and forging sections were completely free of lead segregates. On the basis of these tests, ALCO applied for patents on its lead-addition method.

Advantages in Machinability

Hi-Qua-Led is designed to lower costs in the expensive machining of circular forgings. The lead additive in Hi-Qua-Led Steel acts as a lubricant for the cutting action of the tool, and provides faster removal of metal through heavier cuts and faster speeds. The lead reduces friction to a point where heat is minimized in the section being machined. Tools last longer before redressing or replacement. Some machines, too, can be upgraded through the use of Hi-Qua-Led because their present horsepower will perform cuts that were impossible before. On all machines, Hi-Qua-Led can reduce necessary power output and lower machine wear and tear. In cases where labor and machine time is expensive, machines operating at the same power output cut Hi-Qua-Led faster and deeper.

Hi-Qua-Led STEEL

Trade-mark Reg. applied for

Patent applied for on lead-addition method

Steel Properties Unchanged

ALCO has studied ingots in grades 1015, 1029, 1040, 1050, 1070, 4140, 4150 and 4340 steel, with lead added, and the lead distribution pattern has been unchanged. Customer tests for standard physical-property data and response to carburizing, induction-hardening and flame-hardening have shown that Hi-Qua-Led responds to heat treatment in the same manner as non-leaded steels. Fatigue tests of the reverse-bending type show no difference between Hi-Qua-Led and regular steel heat-treated to 145,000 lb per sq in. tensile.

Use of Hi-Qua-Led Forgings

Hi-Qua-Led circular forgings have a wide application in machining operations where a great deal of metal must be removed, where a very smooth surface finish is desired at low cost, in gear-cutting operations, or almost any milling, drilling or boring application. Threading, planing, shaping and hobbing are also more easily accomplished with Hi-Qua-Led steel forgings.

Hi-Qua-Led may be obtained in any size ALCO forged ring. An extensive inventory of Hi-Qua-Led ingots in many grades is already maintained at the Latrobe, Pa. forging plant. ALCO offices in Atlanta, Beaumont, Chicago, Cleveland, Houston, Kansas City, Los Angeles, New York, Pittsburgh, St. Louis, St. Paul, San Francisco, Schenectady, Tulsa and Washington have complete information. Or, if you wish, send the coupon for a brochure that gives Hi-Qua-Led details.

ALCO

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NEW YORK
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ALCO Products, Inc., PO Box 1065, Schenectady 1, N. Y.

☐ Please send your brochure, "Facts on Leaded Steel for Seamless Forged and Rolled Rings."

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Locomotives • Diesel Engines • Nuclear Reactors • Heat Exchangers • Springs
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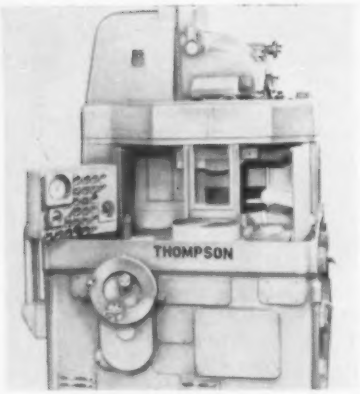
Line of twin rotary circular grinders is announced



Completion of a new line of twin rotary circular grinders with table work surfaces from six to 24 in. has been announced. Cycle time is said to be cut 40 pct because operator loads one magnetic chuck at front position while another part is being ground automatically in rear position. Automatic machine cycle is as follows: Operator presses start button. Wheel head moves downward contacting work piece, removing predetermined amount of stock. Then spark out cycle occurs. Wheel head returns to up position, operator unloads ground parts and cycle starts automatically in rear position. Features include: Horizontal wheelhead grinding with 14 or 20 in. diam wheel to controlled size with automatic compensation of feed screw; free loading time enabling operator to arrange other parts or operate other machines; in-position wheel truing to dress wheel automatically and finish accuracy. *Thompson Grinder Co.*

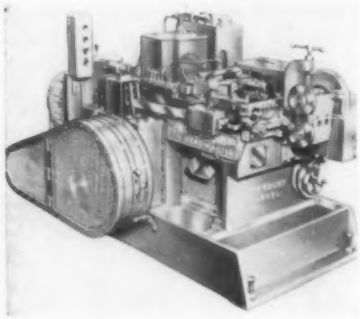
For more data circle No. 30 on postcard, p. 129

New "tube rods" made for semi-automatic hardfacing

Specially developed for semi-automatic hardfacing, a new line of "tube rod" electrodes may also be used with most semi-automatic machines. Electrodes are 3/32 in. diam drawn tubular wire and act much like mild steel solid wire in the welding machine. The tube rod is a perfectly round steel-wire shell with the various alloys firmly enclosed within the shell. The steel shell of the wire is work-hardened. Thus it prevents any deformation or rod snarling during welding. Special tubular construction of electrodes can be driven by feed rollers found in all semi-automatic hardfacing welders. Most important gains reported are: high metal deposition, longer wear life of parts, and welding speed and ease. Extensive field tests are said to indicate a wear life at least 30 pct longer than most similarly applied manual electrodes. *American Manganese Steel Div., American Brake Shoe Co.*

For more data circle No. 31 on postcard, p. 129

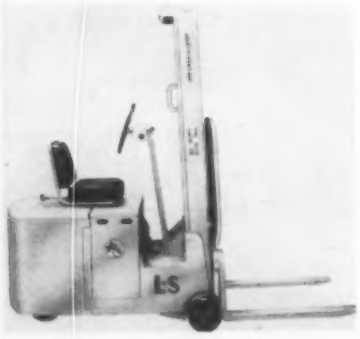
Solid die, double stroke header is world's fastest



This new solid die, double stroke cold heading machine has production rates ranging from 300 to 450 screw or rivet blanks per minute. It will head rivets up to ⅛ x ¾, machine screws up to No. 6 x ¾ and sheet metal screws up to No. 8 x ¾. It can be equipped with standard or Phillips tooling. Claimed to be the world's fastest, it combines features from several types of company's headers. Features include: horizontal shifting punches, toggle actuated gate mounted on rods, friction roll feed, individually adjustable punch holders, cam operated shifter and cut-off, magnetic brake, and a centralized lubrication system. It also has variable speed drive. *Waterbury Farrel Foundry & Mach. Co.*

For more data circle No. 32 on postcard, p. 129

Electric fork truck has a 2500 lb capacity



With a capacity of 2500 lb, this electric fork truck has a 48 in. load length and an extremely short turning radius of only 56¼ in. The truck will right angle stack 48 in. long loads in aisles only 9 ft 3 in. wide. A new I-Beam mast with standard collapsed heights of 68 and 83 in. gives lift heights of 97 and 127 in. and free lift heights of 49 and 64 in. respectively. A new high pressure hydraulic system gives lift speeds of 35 fpm empty and 25 fpm loaded. It uses a completely new 24v electrical system designed for extremely fast and heavy duty operation. It has three speeds forward and reverse, timed acceleration and dynamic braking. *Lewis-Shepard Products, Inc.*

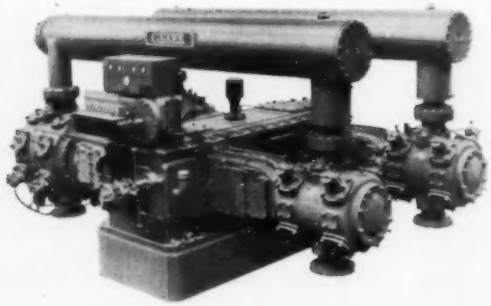
For more data circle No. 33 on postcard, p. 129

any flat means trouble

but in plant air supply it also means lost production!

Unless your plant air supply has adequate capacity in reserve, you may actually slow down your entire production every time you add a new labor-saving air-operated tool or device.

New increased demands on overloaded or overextended air supply inevitably cause a pressure drop all along the line. That means every tool, chuck and wrench slows down . . . and production suffers.



When did you last check your air at the *end* of the line? If it is going "flat," a Clark Balanced/Opposed Air Compressor will restore full pressure and, at the same time, *provide for a planned reserve to take care of future demand.*

There is a Clark Representative near you ready to give you all the facts. Why not call him now or write for your copy of Bulletin 118?

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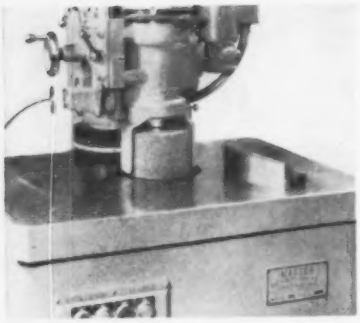
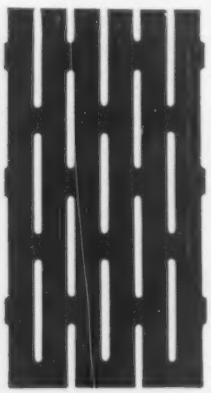
Compressors

Contour grinder removes metal fast



Large capacity and adjustment ease are advantages of a new heavy-duty master profiler and contour grinder featuring ample power and rugged construction. This machine tool is especially designed to fill a long-felt need in the tool and die shop for fast removal of metal on steel punch or heavy press die sections. Accurate and speedy free-hand rough and finish profiling is accomplished, maker says. It is said to precision grind large die sections to close specifications in a minimum of time. A precision spindle supported by a heavy column and over-arm serves as the mounting for the grinding wheel. Wheels (including cup type) range in size up to six in. diam by four in. height. Power is supplied by a completely enclosed two hp motor. *Kindt-Collins Co.*

For more data circle No. 34 on postcard, p. 129



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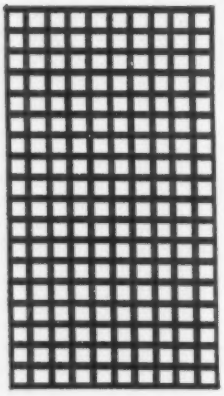
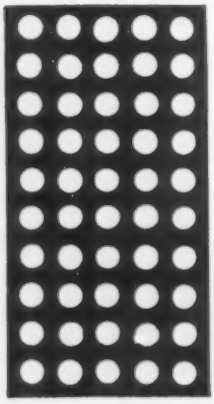
WISSCO
for all your perforated metals





Wide variety of dies for stainless and carbon steel, monel, copper, brass, bronze and aluminum.

Fabricating facilities include rolling, forming, shearing, welding and assembling.

Material to be perforated may be supplied either by us or by your company.

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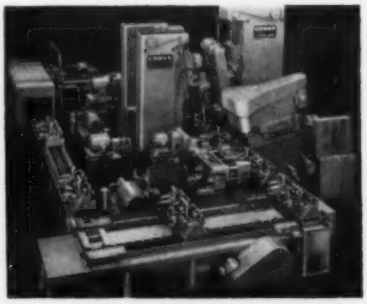
THE COLORADO FUEL AND IRON CORPORATION

Multi-job machine

Designed for fast and easy maintenance, this unit completely machines V-8 manifolds. It utilizes six stations to perform 51 operations: eight milling; 37 drilling, chamfering and spotfacing; and six tapping. It is constructed of machine tools from standard parts, components and assemblies. A major feature is reduction of down



time through incorporation of preset tooling. This eliminates machine adjustments and trial cuts, reduces tool breakage and grinding costs, minimizes scrappage of work, and equalizes operator's time. Palletized work holding fixtures for a right hand and a left hand manifold are provided. *Cross Co.*

For more data circle No. 35 on postcard, p. 129

Load tally stickers

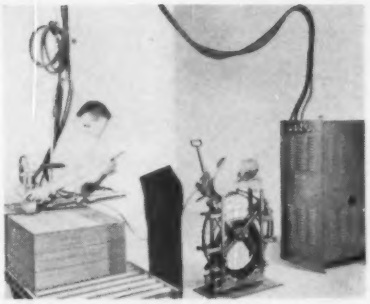
Load tap changer record stickers are being supplied on all company's LTC power and medium transformers. The 5x5 in. adhesive backed stickers can be mounted on any convenient spot on the transformer control panel. *General Electric Co.*

For more data circle No. 36 on postcard, p. 129

Waste cut off shear built into sealer and stretcher

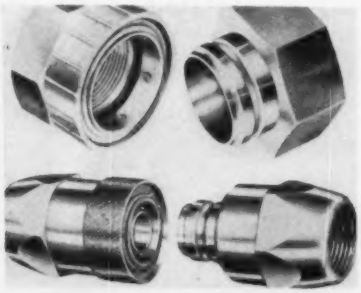
Manufacturers and dealers in heavy items are expected to show interest in a new hydraulic powered heavy duty flat steel strapping combination sealer and stretcher that has been developed. The sealer and stretcher is equipped with a built in waste cut off shear as one of its key features. According to the company's steel strapping engineers, this heavy duty sealer and stretcher can be utilized for the tying of bulky items. These could include such materials as sheet steel or lumber. This model accommodates ¾ and 1¼ in. USS Gerrard heavy duty flat steel strapping. *Gerrard Steel Strapping Div., United States Steel Corp.*

For more data circle No. 37 on postcard, p. 129



All purpose couplings

Coupling manufacturer has announced a new all purpose industrial coupling, both open and self-sealing, to provide full-flow, trouble-free connections. Couplings are said to assure full-flow connections quickly and easily without tools or



fuss. A simple twist of the wrist, one-quarter turn, and the coupling is locked or unlocked with a leak-proof seal—fast, safe and sure. It locks with a "snap" and will not uncouple with vibration, pressure or rotation of the hose to which it is attached. *Roylyn, Inc.*

For more data circle No. 38 on postcard, p. 129

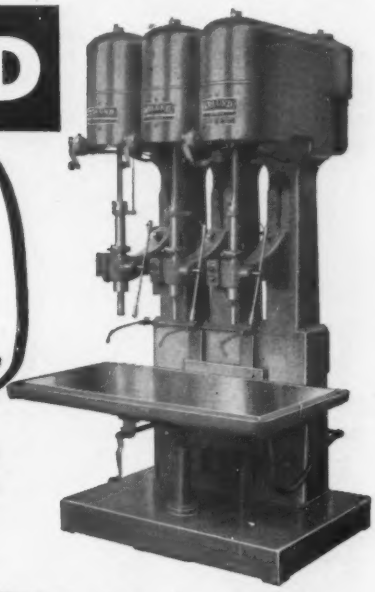
Gland cylinders

New heavy duty double acting cylinders employ a patented gland design and method of prestressing the snap ring within the cylinder. This is said to permit streamlined design, easy maintenance and perfect rod alignment. Piston rods are heavy chromed with aluminum alloy pistons to prevent corrosion and scoring. "V" ring rod packings are independently adjustable. Bronze wiper ring on rod is used to prevent foreign material from entering cylinder. *Densmore Eng. Co., Inc.*

For more data circle No. 39 on postcard, p. 129

EDLUND

Cuts Cost $1280.* On One Job.

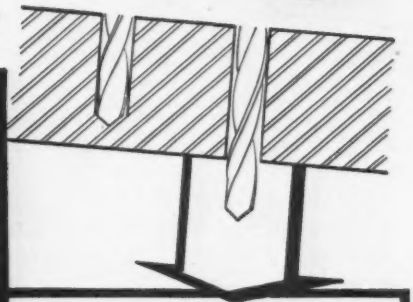


An **EDLUND 2F** *Variable Speed*

Drilling and Tapping Machine Makes the difference

The Edlund 2F instant change variable speed feature lets you find correct drilling speed under practical on-the-job conditions. Saves valuable production time. No gear or belt changes necessary. Increases tool life by using correct drilling speed for each job requirement.

Standard or Special Models, 1 to 8 Spindles. 8", 12" or 15" overhang – capacity to 1¼". Available with Power Feed, Reversing Motor Tapper, Lead Screw Tapper, and Back Gears.



The job . . . drilling 7/16" hole 1½" deep in X1020 steel. The Edlund Variable Speed machine drilled 135 pieces per hour compared with 108 pieces per hour for standard machine production. The 25% increase in production reduced costs $1280.*

Write for Bulletin #140, a colorful, illustrated booklet describing the Edlund 2F. Specifications and quotations prepared promptly on request . . . with no obligation on your part.

*Case history folder #SF on request.

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P.S. In this awning assembly, we suggest an aluminum sheet metal screw. One from Alcoa's complete line of aluminum fasteners.

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ALTERNATE SUNDAY EVENINGS

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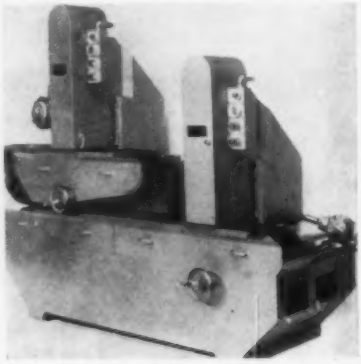
ALCOA ALUMINUM FASTENERS

Abrasive belt grinder

For high-speed precision surfacing both sides of flat parts a new two-level conveyor-type belt grinder has just been introduced. This wet-or-dry grinder features a dual conveyor arrangement, with turn-over hopper device. It is designed to grind both sides of ferrous and nonferrous metals, plastics, glass,



ceramics, and other materials in a single automatic cycle. Parts are carried under the upper grinding head on a 10½ in. x 107 abrasive conveyor belt, and automatically turned over in a gravity feed hopper. The lower conveyor belt, 10½ in. x 206, carries them under the second head for grinding the reverse side. Speed of conveyor belts with ½ hp conveyor drive, is two to 25 fpm, with higher speed ranges available for special applications. *Engelberg Huller Co.*

For more data circle No. 40 on postcard, p. 129

Safety power brake

"One of the most revolutionary brake improvements since the advent of hydraulic brake systems in passenger cars and trucks" is the way manufacturer describes a new dual compensating power brake system. It provides a divided hydraulic system on trucks which separates front and rear brakes. Engineers declare it will provide a measure of safety on trucks heretofore unknown in the automotive industry. It will soon be available for assembly to any size and make of truck. A smaller version will be available for passenger cars. *Kelsey-Hayes Wheel Co.*

For more data circle No. 41 on postcard, p. 129

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TRANSPORTATION EQUIPMENT
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To meet these widely diversified and constantly growing requirements we have developed hundreds of specialized tool arrangements which enable us to give superior service at competitive costs.

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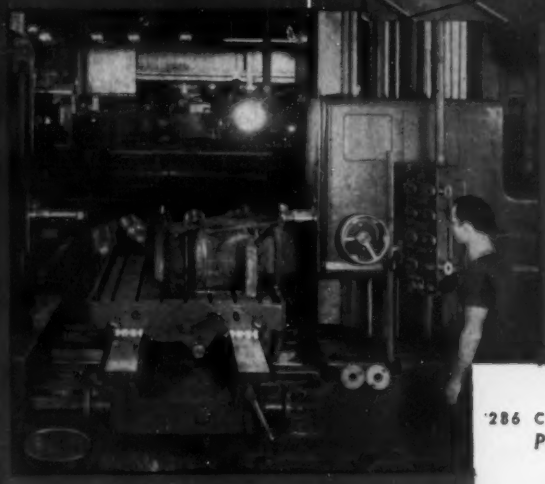
pendant control ... is sure handy for the operator"

Says boring mill operator at Fuller Company, Manheim, Pennsylvania, manufacturers of conveying equipment, coolers, compressors and vacuum pumps. Also, he says, "there are no levers to mess around with. On the Bullard H.B.M., Model 75, I can mill on a 45° angle in any quadrant instead of having to jockey in one direction, then in the other — like I had to do on the old machine."

the machine is outstanding for ease of operation



For full information on all the cost saving advantages offered by the Bullard Horizontal Boring, Milling and Drilling Machine, Model 75, including screw and rack feed, wide speed ranges, extra rigidity in Bed, Head, Head Post and Rear Post, optical measuring equipment (optional) and Automatic Positioning for head and table (optional),

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"KRANE KAR Unloads freight cars of billets weighing up to 6000 lbs.... Stacks them in yard... Transports billets to saw shop... Loads forgings on trucks for shipment. KRANE KAR is easier to use than our old stationary crane, and saves us time. Now we can make full use of our yard for billet inventory." Ask for Bulletin #79.

Ask about our Lease-a-KRANE KAR-Plan ... 1 to 3 Year Lease with Option to Purchase.

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produce more tonnage per grind

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Aluminum ladling unit

Automatic lading unit for aluminum now makes possible fully automatic processing of many types of castings, especially aluminum die casting and permanent mold. Unit is manufactured entirely of high-grade, special refractory materials, and is so arranged that the molten metal being ladled cannot come in

contact with any metal structure. Basic pump has no moving parts, check valves or other devices. Unit operates on principle of a pressurized chamber, the size of the shot depending upon both the time of pressure application and the pressure. It is so designed that ladled metal is withdrawn from beneath the surface of the bath. *Lindberg-Fisher Div., Lindberg Eng. Co.*

For more data circle No. 42 on postcard, p. 129

Graphite dispenser

A new graphite container and gun that dispenses graphite with a squeeze of the fingers, has just been placed on the market. It promises to do for graphite what the aerosol bomb did for insecticides. It is small enough to hold in the hand and sprays dry lubricant at its target while held in any position. Enough graphite is contained in the unit to permit several thousand shots of lubrication to various parts and pieces needing lubrication. *Servwell Products Co.*

For more data circle No. 43 on postcard, p. 129

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The **IRON AGE**

Parts degreaser

This new metal parts degreaser is specially designed for cleaning parts that have a tendency to nest or pack, or parts that have recesses difficult to penetrate with a hand spray. Cleaning cycle is

based on a consecutive boiling solvent. warm liquid and vapor dip, and is described as ideal for removing tightly adhering greases, oils, tripoli and rouges. *Circo Equipment Co.*

For more data circle No. 44 on postcard, p. 129

Point indicator

This point indicator automatically determines angles and center points which ordinarily would require minutes or hours of measuring, scribing, computing and layout. Indicator consists of a mercury bal-

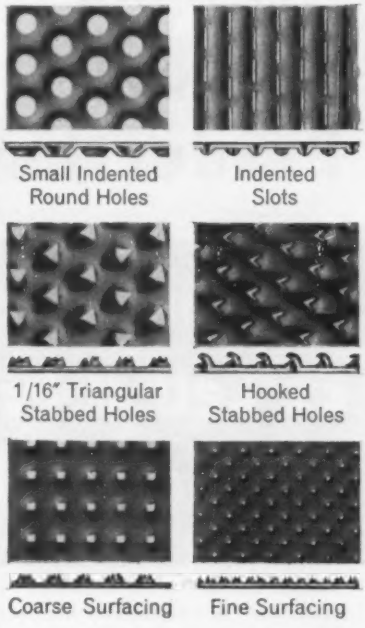
anced level and degree-calibrated dial enclosed and mounted on a a magnetized V-base. *Racine Instrument Co.*

For more data circle No. 45 on postcard, p. 129

H&K

SURFACED PERFORATIONS

are used in many products



Illustrated are only a few of the many surfaced perforations for which we have dies. We have thousands of different die patterns to perforate practically any metal in sheets, rolls and coils.

If your product requires surfaced perforated materials, contact either H & K office or one of our agents. We will be glad to work with you on your perforating requirements.

Fill in and mail coupon to office and warehouse nearest you.

FIND NEAREST H&K AGENT in the 'Yellow Pages'

Listed Under "Perforated Metals"

THE Harrington & King PERFORATING CO.

Chicago Office and Warehouse
5619 Fillmore Street
Chicago 44, Ill.

New York Office and Warehouse
118 Liberty Street
New York 6, N. Y.

Please send me—

- ☐ GENERAL CATALOG NO. 62
- ☐ STOCK LIST of Perforated Steel Sheets
- ☐ SAMPLES of Perforated Plastics and Paper
- ☐ PRICE INFORMATION (NOTE: Send specifications of perforated materials wanted. If necessary send drawings or sketches.)

NAME_____

TITLE_____

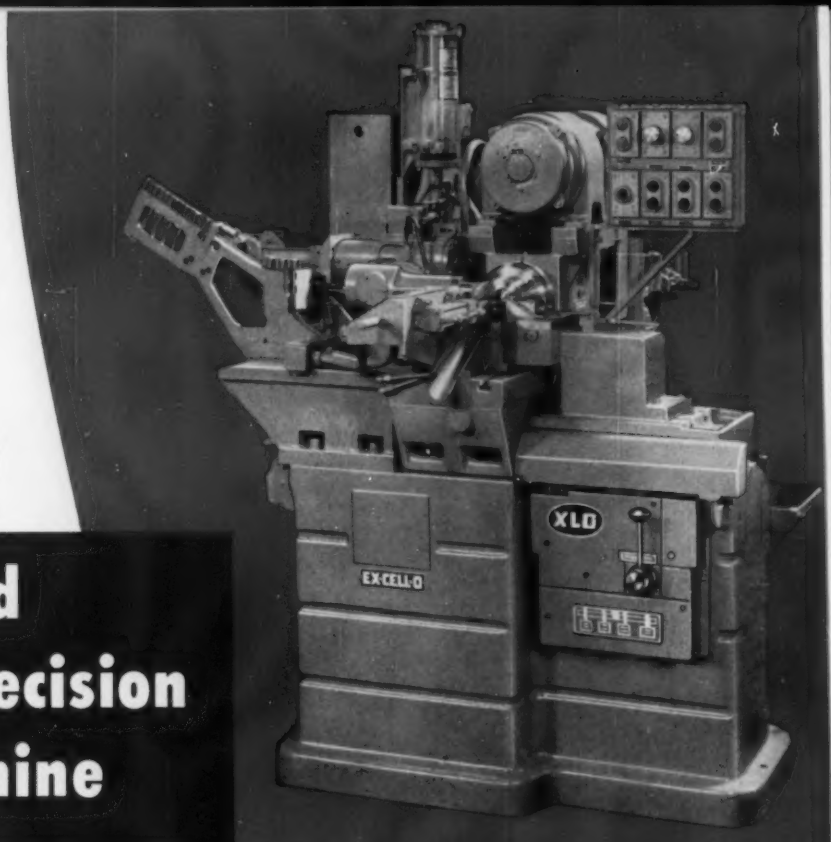
COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

Automatic Handling Speeds Production

On a Standard Ex-Cell-O Precision Boring Machine



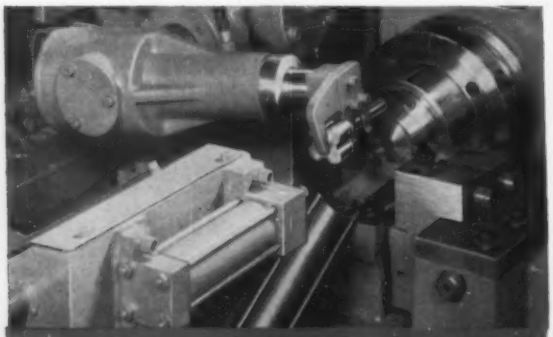
Ex-Cell-O Style 2112-B Precision Boring Machine equipped with a single work spindle and special work handling devices for automatic loading, machining and ejecting.

For a Fraction of Special Machine Cost

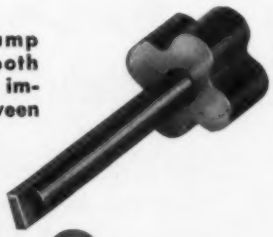
This standard Ex-Cell-O Precision Boring Machine is equipped for facing both ends of oil pump impellers. With automatic work handling equipment it operates at a net production rate of 156 pieces per hour. The use of a standard machine keeps the original cost at a minimum.

In a completely automatic cycle a loading arm picks a part from a chute and loads it into the chuck, then the parts are clamped, machined and ejected.

The flexibility of standard Ex-Cell-O Machines permits low cost automated operation with the addition of work handling equipment. Such a machine may be profitable in your plant. Wire or write Ex-Cell-O in Detroit.



The loading arm is about to load the part into the chuck. After machining, part is ejected into chute in foreground.



In straddle facing oil pump impellers (at right) smooth machine performance is imperative. Width limits between faces are held to .0005″.

EX-CELL-O
CORPORATION
DETROIT 32, MICHIGAN

XLO
EX-CELL-O for PRECISION

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

56-17

The Iron Age SUMMARY . . .

Strike stalemate jolting industry and government out of complacency . . . Outlook for prompt settlement is poor . . . Economy already being hurt . . . Scrap prices up.

It Looks Bad . . . Ominous overtones of the steel strike deadlock are jolting industry and government out of their pre-strike complacency. By end of this week, production losses will approach seven million ingot tons, with no sign of an early settlement.

Close observers are amazed at statements from so-called experts that the strike will not hurt the economy. Dave McDonald, steel union leader, has contributed to this illusion by telling strikers not to worry about lost wages; that they would have been laid off later anyway because there was too much steel in inventories. Some steel consumers are beginning to wonder where these inventories are hiding.

Fact is that the strike has already begun to hurt the economy. Shortages of plate and structurals, apparent before the walkout, are hitting construction, freight-car building, and other dependent industries. Now bar and rod users are beating the bushes for what they can dig up.

No Help Seen . . . The shoe began to pinch before the strike was three weeks old. What looked like comfortable inventories at the start will take on the outlines of an ant hill before the week is out. Hard-pressed consumers are bombarding operating mills and warehouses with pleas for help. They're looking into foreign steel, too.

But there's not much help in either direction, or at least not as much as had been expected. The government has stepped in to earmark defense vital steel shapes and alloys in both mills and warehouses.

Administration leaders are taking an official hands-off attitude. But privately, they're worried. Behind the scenes pressure is building up. At least two Cabinet members are involved in efforts to get the strike settled.

Long-range effects of the strike will be far worse than most people realize. Consumers and mills will be wrestling with supply and delivery problems through this year and into 1957.

Scrap Prices Up . . . Steel production may be curtailed next winter owing to a shortage of iron ore. Shutdown of the mines and tying up of Lake boats deprives stockpiles of the needed surpluses to carry operations through the winter months.

The scrap market, as it often does, reacted contrary to what might be expected in view of the strike. Prices generally were advancing.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	369	324	2,375	2,268
Ingot Index				
(1947-1949=100)	22.9	21.4	147.9	141.0
Operating Rates				
Chicago	6.0	6.0	98.0	96.5
Pittsburgh	6.0	6.0	95.0	100.0
Philadelphia	0.0	0.0	103.0	97.5
Valley	13.0	13.0	92.0	95.0
West	25.0	26.0	102.0	97.0
Detroit	55.0	25.0	98.0	91.0
Buffalo	0.0	0.0	105.0	105.0
Cleveland	0.0	0.0	96.0	99.0
Birmingham	3.5	3.5	23.5	94.0
S. Ohio River	69.0	64.0*	84.0	82.0
Wheeling	55.5	58.0	103.0	95.0
St. Louis	84.0	95.0	97.0	88.0
Northeast	47.0	47.0	85.0	86.0
Aggregate	15.0	14.0	96.5	94.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.179	5.179	5.179	5.176
Pig Iron (Gross Ton)	$60.61	$60.61	$60.29	$59.09
Scrap, No. 1 hvy (gross ton)	$46.50	$44.83	$44.83	$40.33
Nonferrous				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	14.80
Magnesium	34.50	34.50	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	96.125	96.25	94.625	97.875
Zinc, E. St. Louis	13.50	13.50	13.50	12.50

Warehouse Prices Advance

Increases appear in most market areas as strike enters its third week . . . Sheets, strip, shapes, plates and bars are among items raised . . . Producers get on bandwagon, too.

♦ UPWARD REVISIONS of prices are appearing at the warehouse level as the steel strike enters its third week.

While increases varied an idea can be gained of relative advances by noting upward revisions at Detroit.

They are: Hot-rolled sheets up $10.00 per ton, Cold-Rolled sheets up $5.00 per ton, Galvanized sheets up $10.00 per ton, Hot-rolled strip up $10.00 per ton, Hot-rolled plates up $10.00 per ton, Standard structural shapes up $7.00 per ton, Hot-rolled bars up $10.00 per ton and Cold-finished bars up $10.00 per ton. Alloy bars are up $10.00 to $18.00.

U. S. Steel Supply is still operating out of eight of their sixteen warehouses. The cities are: Los Angeles, San Francisco, Portland, Ore., Seattle, Philadelphia, Cleveland, Milwaukee, and Moline, Ill. In these areas U. S. Steel prices generally represent the bottom of a spread.

More steel product increases also came this week. Kaiser Steel Corp., Fontana, Calif. announced increases, depending on product were $9.00 per ton for plates, structurals, hot rolled sheets and strip and carbon bars; and $11.00 per ton for continuous and electric weld pipe.

The new product prices (in dollars per 100 lb) were:

Plates: Carbon Sheared—$5.65; Carbon Universal Mill — $6.10; Abrasion Resistant—$6.80; Kaisaloy Sheared — $7.875; Kaisaloy Universal Mill — $8.325; Alloy Sheared—$7.70 and Alloy Universal Mill—$8.15.

Standard Structural Shapes: Carbon—$5.75 and Kaisaloy—$7.90; Carbon Wide Flange Beams —$5.90, and Bars and Small Shapes: Carbon, merchant quality—5.80; Carbon, special quality —$6.15; alloy bars—$7.175 and Kaisaloy bars—$7.95.

In addition, Hot-rolled Sheets: Carbon — $5.575; Kaisaloy — $7.-625; and Kai-Well (Well Casing Sheets)—$7.075; Hot Rolled Strip: Carbon — $5.575; Kaisa-loy —$8.025; and Alloy—$9.65. Cold rolled Sheets: Carbon—$7.075 and Kaisaloy—$9.625. Cold Rolled Strip (carbon)—$8.70.

Other increases announced by Kaiser were for pig iron—basic $70.00 per ton and foundry $70.50 per ton. Rerolling billets are now $82.50 per ton, forging billets are $100.50 per ton and alloy billets $127.00 per ton.

In making the advances Kaiser noted: "In the event the conclusion of current labor negotiations necessitates further price changes, this schedule will be revised accordingly."

Other producers who have raised prices are Newport Steel Corp., the Milton Steel Div. of Merritt-Chapman & Scott Corp., Granite City Steel Co. and West Virginia Steel and Mfg. Co.

Newport's announced increases from $8 per net ton on hot rolled sheets to $14 per net ton on alloy sheets and plates effective July 6. Milton put through a $9 per ton increase on reinforcing bar on July 5. Granite City has raised sheets $8 and $10 a ton. West Virginia lifted prices effective July 6 $10 per ton on light rails, concrete bars, hot rolled bars and shapes and billets and slabs.

Joseph T. Ryerson & Son, Inc., with warehouses in sixteen cities issued interim price changes pending settlement of the steel strike.

They stated, "All steel users have realized for several months that producers would have to increase prices, whether or not there was a strike, to compensate for any increase in wage rates and indirect benefits on expiration of the old union contract.

"Effective July 1st, we increased the wages of our plant employees. Replacement costs are up, many smaller steel mills have already announced higher prices, and if the strike is prolonged, reduced volume of business will force costs up. These are some of the factors affecting both the buyer and seller of steel.

"Since all material obtained by us after July 1 to replace our stocks will be shipped to us at higher prices, we are issuing an interim price announcement effective July 6, 1956."

Ryerson's price increases included:

Base prices increased $10.00 a ton on hot rolled carbon bars, hot rolled plates, safety plates, structural shapes, hot rolled sheets, hot rolled strip, cold finished carbon bars, alloy bars (hot rolled), alloy bars (cold finished), cold rolled sheet coils, galvanized sheets and hot rolled P & O sheets.

They advanced flat cold rolled sheets $5.00 per ton, while stainless sheets, plates and bars were increased $60.00 per ton.

In addition, seamless and welded mechanical tubing, stainless tubing, boiler tubes, and structural tubing were raised 5 pct.

Among producers, Laclede Steel Co., St. Louis, advanced wire rod to $5.90 per 100 lb, carbon steel bars to $5.20 per 100 lb, manufacturers' bright wire to $7.275 per 100 lb and hot rolled strip to $4.85 per 100 lb.

Purchasing Agent's Checklist

SPECIAL REPORT: Electric power's $75 billion expansion plan . . . p. 67

MARKETING: Aluminum foil on new sales boom . . . p. 72

MANAGEMENT: Should purchasing be decentralized . . . p. 75

Comparison of Prices

(Effective July 17, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	July 17 1956	July 10 1956	June 19 1956	July 19 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.325¢
Cold-rolled sheets	5.325	5.325	5.325	5.325
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.85
Hot-rolled strip	4.325	4.325	4.325	4.325
Cold-rolled strip	6.28	6.28	6.28	6.375
Plate	4.52	4.52	4.52	4.52
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	44.50	44.50	44.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) coke	$9.85	$9.85	$9.85	$9.05
Tinplates, electro (0.50 lb.)	8.55	8.55	8.55	7.75
Special coated mfg. ternes	9.10	9.10	9.10	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.65¢
Cold finished bars	5.90	5.90	5.90	5.90
Alloy bars	5.65	5.65	5.65	5.65
Structural shapes	4.60	4.60	4.60	4.60
Stainless bars (No. 302)	38.25	38.25	38.25	38.25
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	6.60¢	6.60¢	6.60¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.725
Light rails	5.65	5.65	5.65	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$68.50
Slabs, rerolling	68.50	68.50	68.50	68.50
Forging billets	84.50	84.50	84.50	84.50
Alloy blooms, billets, slabs	96.00	96.00	96.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.179¢	5.179¢	5.179¢	5.176¢

	July 17 1956	July 10 1956	June 19 1956	July 19 1955
Pig Iron: (per gross ton)				
Foundry del'd Phila.	$65.26	$65.26	$65.26	$53.69
Foundry Valley	60.50	60.50	60.50	59.00
Foundry, Southern Cin'ti	62.93	62.93	62.93	62.93
Foundry, Birmingham	57.67	57.67	55.00	55.00
Foundry, Chicago	60.50	60.50	60.50	59.00
Basic del'd Philadelphia	64.48	64.48	64.48	62.77
Basic, Valley furnace	60.00	60.00	60.00	58.50
Malleable, Chicago	60.50	60.50	60.50	59.00
Malleable, Valley	60.50	60.50	60.50	59.00
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢

‡ 74.76 pct Mn base.

Pig Iron Composite: (per gross ton)				
Pig iron	$60.61	$60.61	$60.29	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$46.50	$44.50	$44.50	$41.50
No. 1 steel, Phila. area	48.50	46.50	46.50	41.50
No. 1 steel, Chicago	44.50	43.50	43.50	39.50
No. 1 bundles, Detroit	39.50	39.50	37.50	32.50
Low phos., Youngstown	52.50	50.00	48.50	42.50
No. 1 mach'y cast, Pittsburgh	54.50	54.50	54.50	44.50
No. 1 mach'y cast, Philadel'a	54.50	54.50	54.50	44.50
No. 1 mach'y cast, Chicago	47.50	47.50	48.50	49.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$46.50	$44.83	$44.83	$40.33
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50	$14.50	$14.50	$13.25
Foundry coke, prompt	17.50	17.50	17.50	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$46.00	$46.00	$46.00	$36.00
Copper, Lake, Conn.	46.00	46.00	46.00	36.00
Tin, Straits, New York	*96.125*	96.25	94.625	97.875
Zinc, East St. Louis	13.50	13.50	13.50	12.50
Lead, St. Louis	15.80	15.80	15.80	14.80
Aluminum, virgin ingot	25.90	25.90	25.90	23.20
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	34.50	34.50	34.50	29.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	62.00	62.50	63.00	63.50	.....
Birdsboro, Pa. *B6*	62.00	62.50	63.00	63.50	.....
Birmingham *R3*	54.50	55.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	60.00	60.50	61.00	61.50	.....
Buffalo *H1*	60.00	60.50	61.00	.....	.....
Buffalo *W6*	60.00	60.50	61.00	61.50	.....
Chester *C17*	62.00	62.50	63.00	.....	.....
Chicago *I4*	60.00	60.50	60.50	61.00	.....
Cleveland *A5*	60.00	60.50	60.50	61.00	65.00†
Cleveland *R3*	60.00	60.50	60.50	61.00	.....
Duluth *I4*	60.00	60.50	60.50	61.00	65.00†
Erie *I4*	60.00	60.50	60.50	61.00	65.00†
Everett *M6*	.....	63.75	64.25	.....	.....
Fontana *K1*	70.00	70.50	.....	.....	.....
Geneva, Utah *C7*	60.00	60.50	.....	.....	.....
Granite City *G2*	61.90	62.40	62.90	.....	.....
Hubbard *Y1*	.....	.....	60.50	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Midland *C11*	60.00	.....	.....	.....	.....
Minnequa *C6*	62.00	62.50	63.00	.....	.....
Monessen *P6*	60.00	.....	.....	.....	.....
Neville Is. *P4*	62.50	63.00	63.00	63.50	67.50†
N. Tonawanda *T1*	.....	60.50	61.00	61.50	.....
Pittsburgh *U1*	60.00	.....	60.50	61.00	.....
Sharpsville *S3*	60.00	60.50	60.50	61.00	.....
So. Chicago *R3*	60.00	.....	60.50	.....	.....
Steelton *B3*	62.00	62.50	63.00	63.50	68.00
Swedeland *A2*	62.00	62.50	63.00	63.50	.....
Toledo *I4*	60.00	60.50	60.50	61.00	.....
Troy, N. Y. *R3*	62.00	62.50	63.00	63.50	68.00
Youngstown *Y1*	.....	.....	60.50	61.00	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos.

Silvery Iron: Buffalo, *H1*, $70.25; Jackson, *J1, G1*, $89.00. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.a.b. mill.

←To identity producers, see Key on p. 180→

Product	201	202	301	302	303	304	316	321	347	410	416	430
Ingots, reroll.	18.50	19.75	19.25	20.50	—	21.75	33.00	28.50	35.25	15.00	—	15.25
Slabs, billets, reroll.	23.00	25.50	23.75	26.25	28.75	27.50	41.75	33.50	44.50	19.50	—	19.75
Forg. dcs., die blks., rgs.	—	—	—	—	—	—	—	—	—	—	—	—
Billets, forging	—	31.00	31.75	32.00	34.75	33.75	52.75	39.75	52.50	25.50	26.00	26.00
Bars, struct.	—	36.75	38.00	38.25	41.00	40.25	62.75	47.25	62.00	30.50	31.00	31.00
Plates	—	38.75	40.00	40.25	42.75	43.00	66.00	51.25	66.75	31.75	33.00	32.25
Sheets	42.25	42.50	44.25	44.50	52.25	47.25	70.25	56.25	75.50	36.25	—	36.75
Strip, hot-rolled	31.00	33.50	32.00	34.50	—	37.25	50.75	45.75	61.25	28.00	—	28.75
Strip, cold-rolled	39.00	42.50	41.00	44.50	—	47.25	70.25	58.25	75.50	36.25	—	36.75
Wire CF, HR; Rod HR	—	—	36.00	36.25	39.00	38.25	59.75	45.00	59.00	29.00	29.50	29.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2* (2.25¢ lower on Type 430), *J2;* Baltimore, *E1;* Middletown, O., *A7)* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Philadelphia, *D5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., C2; Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *C5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6;* Gary, *U1.*

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* S. Chicago, *U1;* Syracuse, N. Y. *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5;* Ft. Wayne, *I4;* Philadelphia, *D5;* Detroit, *R5;* Gary, *U1.*

Wire: Waukegan, *A5)* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Philadelphia, *D5;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forgings billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1.*

Is the Scrap Shortage Real?

In spite of steel strike, prices climb . . . Brokers pay higher prices to cover existing orders . . . Scrap inventories are low, collections difficult . . . Composite climbs.

◆ AN UNPRECEDENTED, surprising scrap shortage in the midst of a steel strike materialized this week sending prices of steelmaking grades up from $1 to $3 in most markets.

Although the "shortage" had an artificial quality about it, these facts remained: At least one middlewestern mill, still operating under its labor contract, found its scrap inventory dwindling. Brokers were forced to raise their buying prices to cover existing orders. Dealer yards continued to be bare despite advancing prices.

One reason for the advance is that prices were depressed below a normal level just before the steel strike and were climbing prior to the actual strike date.

In addition, plant vacations and lower rates of production resulted in slow industrial scrap generation. Smaller industrial lists continued to bring higher prices even after the mills were idled.

A larger number of mills than usual continued to operate through extensions of their labor contracts or laid scrap down elsewhere. Many of these mills are electric furnace operations, heavy users of primary grades of scrap.

Dealers, in view of the advancing prices, contend that scrap collections are very low, that going prices don't have the effect of pulling in great stocks.

It was generally believed in the trade that the market could withstand a week or more of the strike before prices declined. THE IRON AGE composite price rose $1.67 to $46.50 in the advancing market.

Pittsburgh . . . Continued broker buying at higher prices advanced the steelmaking grades $2 in a market of surprising strength. Some of the buying is speculative, but at the same time brokers are having difficulty filling standing orders. Mills contend they are interested only in production scrap at the moment, but the flow of industrial scrap is dropping. Dealers have little or no inventory.

Chicago . . . With mills continuing to lay down scrap, buildup of materials in dealer yards has been slow, particularly in view of the plant vacation period and production closedowns among automotive suppliers, farm equipment plants and other important scrap generators. Effect has been to advance or hold prices firm at present levels, with scrap proving difficult to procure at present prices in most grades. It is now predicted that the scrap industry can weather another week of steel strike with little weakening in prices.

Philadelphia . . . This market is exhibiting surprising strength. Despite the fact that most of the mills in the area are still idle, there has been enough scattered activity to push the price of steelmaking grades up $2. Mills that are operating are doing some buying, and a number of struck mills are buying, but laying down the scrap in dealers' yards pending labor settlement. Export activity, while normally not a factor, is being carried on in volume to put a platform under steelmaking and premium grades.

New York . . . Prices of steelmaking grades and blast furnace items advanced $1 for the most part. Export continues strong and purchases by operating mills in the fringe areas resulted in the advancing prices. Dealers are having difficulty obtaining scrap to meet orders.

Detroit . . . Tone of the market continues to be strong, but the strength is more a reflection of a shortage of scrap. Brokers are continuing to lay down material on the docks with some scrap moving by water to Canada. Auto lists will close next week and prices are expected to climb on the strength of low scrap supplies.

Cleveland . . . Prices of steelmaking grades climbed $2 in both Cleveland and the Valley. A combination of some representative purchases by an operating mill, high prices of industrial lists, and new broker activity brought the higher price level despite the steel strike. Mills are showing little interest in dealer scrap and for the most part are confining their activity to production scrap, which finds a ready market. Railroad scrap also climbed $2 on the basis of recent lists.

Birmingham . . . There appears to be a little additional activity in premium grades of scrap steel this week. Some scrap is continuing to move out of the Carolinas to northern mills not on strike. The export market is reported strong, but exporters apparently will hold the price line as long as mills are not buying. Last year export prices forced higher mill prices for scrap. Little scrap is coming into the yards and dealers are showing some reluctance to sell scrap they cannot replace at today's level.

St. Louis . . . Business as usual continues in this market with mills operating at a high rate. The market continues strong as supplies are extremely difficult to obtain and some items are from $1 to $3 higher. Reports here are that mills everywhere are laying down scrap.

Cincinnati . . . Most of the mills in the area are operating and the overall tone of the market is stronger. However, scrap that is moving is on the basis of monthly orders, so price levels remain static.

Buffalo . . . Some strength underlies the market here, due principally to strength in Pittsburgh and Valley regions. There is some activity among small foundries. Scrap yards still have very low inventories.

Boston . . . Although there is little activity in the market, some small tonnages moved at quoted prices, keeping the price level stable. Export is not particularly strong and the market is a repetition of recent weeks.

West Coast . . . Prices in Los Angeles, San Francisco, Seattle, continue firm despite the strike. Exporting is still active and there's a more-than-normal letdown in flow.

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IMPORT & EXPORT — **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address:* **FORENTRACO**

Scrap Prices *(Effective July 17, 1956)*

Pittsburgh

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and ms. turn.	32.00 to 33.00
Shoveling turnings	36.00 to 37.00
Cast iron borings	36.00 to 37.00
Low phos. punch'gs plate	53.00 to 54.00
Heavy turnings	44.00 to 45.00
No. 1 RR. hvy. melting	52.00 to 53.00
Scrap rails, random lgth.	63.00 to 64.00
Rails 2 ft and under	67.00 to 68.00
RR. steel wheels	59.00 to 60.00
RR. spring steel	59.00 to 60.00
RR. couplers and knuckles	59.00 to 60.00
No. 1 machinery cast	54.00 to 55.00
Cupola cast	46.00 to 47.00
Heavy breakable cast	44.00 to 45.00

Chicago

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	37.00 to 39.00
No. 1 factory bundles	50.00 to 51.00
No. 1 dealers' bundles	45.00 to 46.00
No. 2 dealers' bundles	33.00 to 35.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	55.00 to 56.00
Low phos. punch'gs plate	53.00 to 54.00
Low phos. 3 ft and under	52.00 to 53.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lght	60.00 to 61.00
Rerolling rails	68.00 to 69.00
Rails 2 ft and under	67.00 to 68.00
Locomotive tires, cut	55.00 to 56.00
Cut bolsters & side frames	55.00 to 56.00
Angles and splice bars	61.00 to 62.00
RR. steel car axles	68.00 to 70.00
RR. couplers and knuckles	54.00 to 55.00
No. 1 machine cast	47.00 to 48.00
Cupola cast	44.00 to 45.00
Heavy breakable cast	38.00 to 39.00
Cast iron brake shoe	38.00 to 39.00
Cast iron wheel	49.00 to 50.00
Malleable	58.00 to 59.00
Stove plate	40.00 to 41.00
Steel car wheels	54.00 to 56.00

Philadelphia Area

No. 1 hvy. melting	$48.00 to $49.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	48.00 to 49.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	33.00 to 34.00
Mixed bor. short turn.	33.00 to 34.00
Cast iron borings	37.00 to 38.00
Shoveling turnings	37.00 to 38.00
Clean cast chem. borings	42.00 to 43.00
Low phos. 5 ft and under	51.00 to 52.00
Low phos. 2 ft and under	52.00 to 53.00
Low phos. punch'gs	52.00 to 53.00
Elec. furnace bundles	49.00 to 50.00
Heavy turnings	43.00 to 44.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
Rails 18 in. and under	63.00 to 64.00
Cupola cast	47.00 to 48.00
Heavy breakable cast	51.00 to 52.00
Cast iron car wheels	57.00 to 58.00
Malleable	64.00 to 65.00
Unstripped motor blocks	38.00 to 39.00
No. 1 machinery cast	54.00 to 55.00

Cleveland

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Cut struct'r'l & plates, 2 ft & under	53.00 to 54.00
Drop forge flashings	45.00 to 46.00
Low phos, punch'gs, plate	46.00 to 47.00
Foundry steel, 2 ft & under	51.00 to 52.00
No. 1 RR. heavy melting	50.00 to 51.00
Rails 2 ft and under	69.00 to 70.00
Rails 18 in. and under	70.00 to 71.00
Railroad grate bars	39.00 to 40.00
Steel axle turnings	35.00 to 36.00
Railroad cast	53.00 to 54.00
No. 1 machinery cast	53.00 to 54.00
Stove plate	50.00 to 51.00
Malleable	59.00 to 60.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	47.00 to 48.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. plate	52.00 to 53.00

Buffalo

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 busheling	44.00 to 45.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	52.00 to 53.00
Scrap rails, random lgth.	57.00 to 58.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast	50.00 to 51.00
No. 1 cupola cast	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	39.00 to 40.00
No. 2 bundles	28.00 to 29.00
New busheling	39.00 to 40.00
Drop forge flashings	38.50 to 39.50
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs, plate	39.00 to 40.00
No. 1 cupola cast	41.00 to 42.00
Heavy breakable cast	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$39.50 to $40.50
No. 2 hvy. melting	37.00 to 38.00
No. 1 bundles	39.50 to 40.50
No. 2 bundles	33.00 to 34.00
Machine shop turn.	25.00 to 26.00
Cast iron borings	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
No. 1 RR. hvy. melting	49.50 to 50.50
Rails, random lengths	57.00 to 58.00
Rails 18 in. and under	62.00 to 63.00
Locomotive tires uncut	53.00 to 54.00
Angles and splice bars	55.00 to 56.00
Std. steel car axles	65.00 to 66.00
RR. specialties	54.50 to 55.50
Cupola cast	46.00 to 47.00
Heavy breakable cast	38.00 to 39.00
Cast iron brake shoes	42.00 to 43.00
Stove plate	40.00 to 41.00
Cast iron car wheels	47.00 to 48.00
Rerolling rails	69.00 to 70.00
Unstripped motor blocks	36.00 to 37.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	26.00 to 26.50
No. 1 busheling	36.00 to 37.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Machine shop turn.	22.00 to 22.50
Mixed bor. and short turn.	23.00 to 23.50
Shoveling turnings	24.00 to 24.50
Clean cast chem. borings	28.00 to 29.00
No. 1 machinery cast	41.50 to 42.50
Mixed cupola cast	36.00 to 36.50
Heavy breakable cast	39.50 to 40.50
Stove plate	34.00 to 35.00
Unstripped motor blocks	25.50 to 26.50

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 bundles	31.00 to 32.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	29.00 to 30.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	46.00 to 46.50
Mixed yard cast	43.00 to 43.50
Charging box cast	43.00 to 43.50
Heavy breakable cast	43.00 to 43.50
Unstripped motor blocks	32.00 to 33.00

Birmingham

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	34.00 to 35.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	20.00 to 21.00
Electric furnace bundles	41.00 to 42.00
Bar crops and plate	51.00 to 52.00
Structural and plate, 2 ft	49.00 to 50.00
No. 1 RR. hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	54.00 to 55.00
Rails, 18 in. and under	59.00 to 60.00
Angles & splice bars	54.00 to 55.00
Rerolling rails	64.00 to 65.00
No. 1 cupola cast	48.50 to 49.50
Stove plate	47.00 to 48.00
Charging box cast	32.00 to 33.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	37.50 to 38.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.50 to $43.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 bundles	42.50 to 43.50
No. 2 bundles	31.50 to 32.50
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	28.00 to 29.00
Low phos. 18 in. & under	51.00 to 52.00
Rails, random lengths	57.00 to 58.00
Rails, 18 in. and under	64.00 to 65.00
No. 1 cupola cast	43.00 to 44.00
Hvy. breakable cast	43.00 to 44.00
Drop broken cast	52.00 to 53.00

San Francisco

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	40.00
No. 1 bundles	42.00
No. 2 bundles	35.00
No. 3 bundles	29.00
Machine shop turn.	24.00
Cast iron borings	25.00
No. 1 RR. hvy. melting	43.00
No. 1 cupola cast	48.00

Los Angeles

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 1 bundles	41.00
No. 2 bundles	31.00
No. 3 bundles	27.00
Machine shop turn.	$21.00 to 22.00
Shoveling turnings	24.00
Cast iron borings	24.00
Elec. furn. 1 ft and under	42.00
No. 1 RR. hvy. melting	42.00
No. 1 cupola cast	45.00

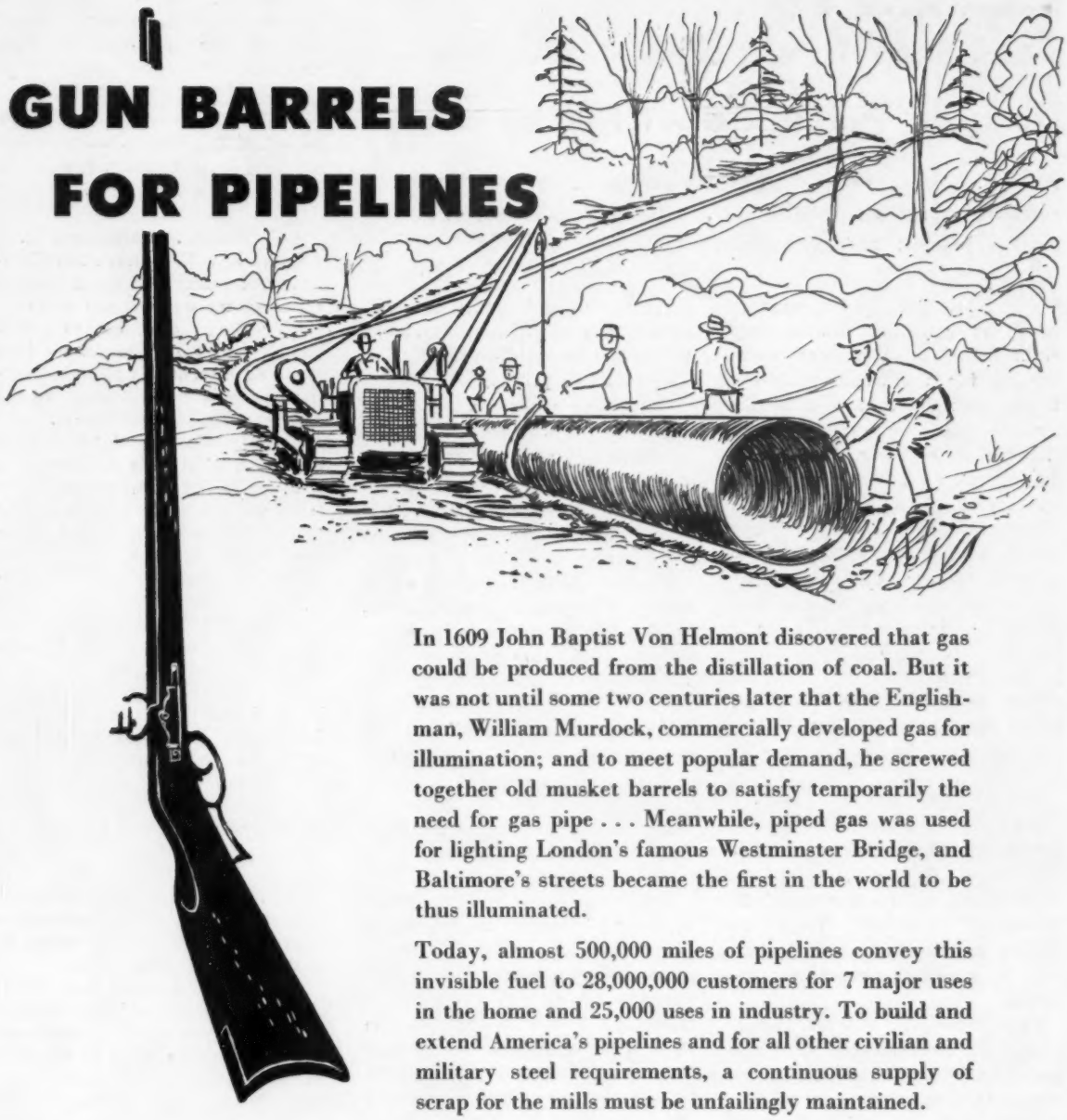
Seattle

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	40.00
No. 2 bundles	31.00
No. 3 bundles	27.00
No. 1 cupola cast	45.00
Mixed yard cast	45.00

Hamilton, Ont.

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	38.00
No. 1 bundles	43.00
No. 2 bundles	35.00
Mixed steel scrap	37.00
Bushelings	33.50
Bush., new fact., prep'd	41.00
Bush., new fact., unprep'd	37.00
Machine shop turn.	21.00
Short steel turn.	26.00
Mixed bor. and turn.	22.00
Rails, rerolling	51.00
Cast scrap	50.00

GUN BARRELS FOR PIPELINES



In 1609 John Baptist Von Helmont discovered that gas could be produced from the distillation of coal. But it was not until some two centuries later that the Englishman, William Murdock, commercially developed gas for illumination; and to meet popular demand, he screwed together old musket barrels to satisfy temporarily the need for gas pipe . . . Meanwhile, piped gas was used for lighting London's famous Westminster Bridge, and Baltimore's streets became the first in the world to be thus illuminated.

Today, almost 500,000 miles of pipelines convey this invisible fuel to 28,000,000 customers for 7 major uses in the home and 25,000 uses in industry. To build and extend America's pipelines and for all other civilian and military steel requirements, a continuous supply of scrap for the mills must be unfailingly maintained.

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Copper Price Gap Closing

All U. S. producers now charging 40¢ per lb . . . Custom smelters boost their price to 38¢ . . . RST world's lowest at 34.375¢, expects increase momentarily.

◆ COPPER market continues to have its ups and downs—only right now most sellers seem headed for the same goal—the happy medium that was beginning to look almost unattainable.

Down from their 46¢ per lb heights are all of the major U. S. producers. Both Kennecott and Anaconda followed the Phelps Dodge lead and pegged the new price at 40¢ per lb.

Custom smelters, who had dropped their price to 37.5¢ per lb less than two weeks ago, came up to 38¢ per lb.

Big Belgian Congo producer, Union Miniere du Haut Katanga, boosted its price to 36¢ per lb from 35.10¢.

London Metals Exchange is showing some tendencies toward recovery, with current price flirting around 36¢ per lb.

Lowest price in the world is Rhodesian Selection Trust at 34.375¢ per lb, but upward revision is expected almost momentarily.

The direction of the price changes is considerably more important to consumers than mere monetary difference.

Since the middle of 1955 when domestic prices began to soar, copper has been thoroughly challenged in all of its applications. Any major substitution that was inevitable has been made. Therefore, markets in which copper is still king are more interested in stability and uniformity of price, as well as ready availability, so as to be able to stabilize production schedules and prices.

Predicting where and if world copper prices will meet still ranks as highly hazardous. However, the recent developments indicate that copper is closer than ever to a one world price, probably about 38¢ per lb.

Copper Institute statistics for the last reported month, June, show a slight decrease in world refined production from the previous month, 248,478 tons compared to 266,551. Deliveries to fabricators were also off, 243,308 tons compared to 253,871 tons in May. Refined stocks on hand at refineries reversed the downward trend started in February, and increased a total of 15,109 tons.

MAGNESIUM . . . The second producer of primary magnesium in the U. S. will be Alabama Metallurgical Corp., Selma, Ala., a new company set up and entirely controlled by Brooks & Perkins, Detroit, a major magnesium fabricator, and Dominion Magnesium, Canada. Latter company developed the ferro-silicon method of refining high purity magnesium which will be utilized by AMC.

Some calcium will be produced. Works will also make its own ferro silicon.

Chairman of the new corporation is E. Howard Perkins, president of Brooks & Perkins. President is Lester G. White, formerly managing director of Dominion Magnesium.

Cost of the new installation is estimated at $7 million. Rated capacity of 10,000 tons annually will increase total domestic magnesium capacity by about 15 pct.

ALUMINUM . . . Aluminum Co. of America and the United Steel Workers, representing the biggest segment of aluminum workers, are currently talking things over, but as yet it doesn't mean too much. As had been expected labor, at this point, is insisting on a new contract based on the results of the steel settlement.

If steel strike is settled before the expiration of Alcoa's and Reynold's contract on July 31, tempo of the talks will no doubt pickup, taking their cue from length of time to the deadline date for pace.

If on the other hand the steel strike is still on at the end of July, present contracts will probably be extended with the new contract retroactive to August 1.

Talks with the second largest union in the industry, Aluminum Workers International, have been initiated and are in the exploratory stages.

No date for meeting with United Mine Workers or United Auto Workers, representing a minor part of the industry, has been set.

TIN . . . Market is much easier and relatively inactive with a communique from Malaya indicating an easing in the threat of a general strike.

To back up demands for special overtime pay for working Sunday, which heretofore has been considered a regular workday, some 18,000 mine workers have taken the last few Sundays off. Indications were that if this did not bring the situation to a head, they would cease work altogether.

The union has agreed to place its case before an arbitration board. The matter of additional pay would not cause so much difficulty, except that union is insisting the higher pay be made retroactive to 1954.

Other matters on which the union and the management of 60 European owned mines are at odds, including wage rates and working conditions, will not be brought to the attention of the arbitration board. Local feeling is that if the retroactive Sunday pay issue is settled, other items will iron out relatively easily. For full story on the tin outlook see page 74.

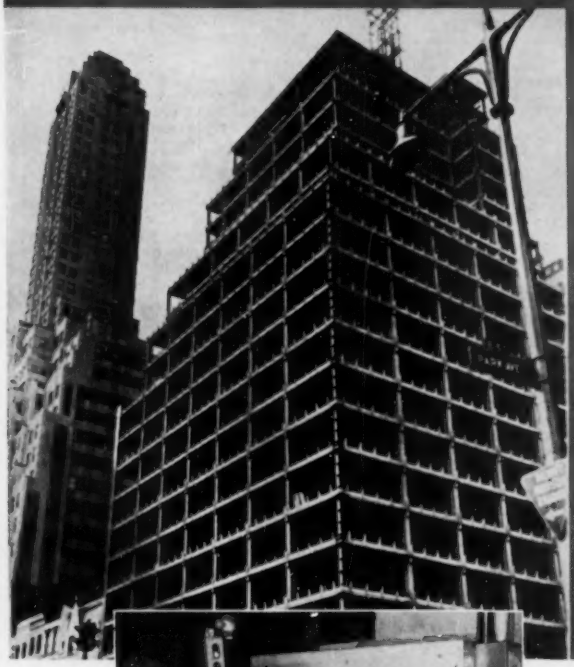
Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	July 11	July 12	July 13	July 14	July 16	July 17
Copper, electro, Conn.	40.00	40.00	40.00	40.00	40.00	40.00
Copper, Lake, delivered	40.00	40.00	40.00	40.00	40.00	40.00
Tin, Straits, New York	94.75	95.025	95.875	....	96.125	96.125*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices. **Tentative*

Curtain Going Up!



The Marion Davies Building, New York, was completely enclosed in *10 hours*—through the miracle of anodized aluminum "curtain" walls. Giant two-story panels are manufactured by General Bronze Corp., using an **H-VW-M AUTOMATIC ANODIZING SYSTEM.**

General Bronze Corp. led the field when they anticipated the vastly increased use of anodized aluminum in the building industry. The same wisdom and foresight motivated General Bronze when they called on H-VW-M to supply their giant, streamlined new anodizing system. **H-VW-M DESIGNED, MANUFACTURED AND INSTALLED** it from beginning to end. And the benefits to General Bronze: tripled production . . . improved quality control . . . and the assurance that H-VW-M—the **ONE SOURCE** they chose—assumed **COMPLETE RESPONSIBILITY** for the entire system, from concept to production.

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, N. J.

Plants: Matawan, N. J. • Grand Rapids, Mich.

SALES OFFICES: Anderson (Ind.) • Baltimore • Beloit (Wisc.) Boston • Bridgeport • Chicago • Cleveland • Dayton • Detroit Grand Rapids • Los Angeles • Louisville • Matawan Milwaukee • New York • Philadelphia • Pittsburgh • Plainfield Rochester • St. Louis • San Francisco • Springfield (Mass.) Utica • Wallingford (Conn.)

H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

Nonferrous Prices *(Effective July 17, 1956)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1100, 3003	42.3	40.2	39.0	38.0
5052	49.8	44.9	43.2	41.4
6061-0	46.9	42.7	40.9	40.8

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6–8	43.1–44.8	58.1–61.7
12–14	43.8–45.2	59.0–63.3
24–26	46.8–47.2	69.2–73.6
36–38	55.1–55.7	92.0–95.8

Screw Machine Stock—2011-T-3

Size*	¼	⅜–⅝	¾–1	1¼–1½
Price	56.0	54.9	53.6	51.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.310	$1.742	$2.175	$2.605
.024 gage	1.630	2.177	2.707	3.247

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250–3.00	.250–2.00	.188	.081	.032
FSi Stand. Grade	.....	65.6	66.5	75	100
FSI Spec.	.....	88.9	91.1	103.5	163.1
Tread Plate	.....	67.8	68.9	.....	.....
Tooling Plate	70.2	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (FS)	66.4–69.0	67.5–69.6	72.1–72.7	84.9–85.8
Spec. Grade (AZ31B)	81.4–84.0	82.5–84.6	87.1–87.7	99.9–100.8

Alloy Ingot

AZ91B (Die Casting) ..... 35 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 39.25 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	83	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	93
Angles, HR	87	74	93
Plate, HR	97	87	95
Seamless tube	122	110	153
Shot, blocks	....	71	....

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)
(lots of 1000-2000 lbs.)

	Sheet	Wire	Rod	Tube
Copper	66.63	.....	.....	66.82
Brass, 70/30	56.60	57.14	.....	59.51
Brass, Low	60.85	61.39	60.79	63.66
Brass, R L	62.19	55.03	62.13	65.00
Brass, Naval	60.72	.....	55.03	63.88
Muntz Metal	58.84	52.85	54.65	.....
Comm. Bz.	64.08	64.62	64.62	66.64
Mang. Bz.	64.46	.....	58.56	.....
Phos. Bz. 5%	84.58	.....	.....	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $12.10-$12.60; alloy, $15.00-$15.75; Plate, HR, commercially pure, $10.00-$10.50; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.00-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.55-$7.80; alloy, $7.55-$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 98+%, 10,000 lb. freight alloyed 25.90
Aluminum pig 24.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be $43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be $74.75
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Cobalt, 97-99% (per lb) ... $2.60 to $2.67
Copper, electro, Conn. Valley 40.00
Copper, Lake, delivered 40.00
Gold, U. S. Treas., per troy oz. ... $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. ... $100 to $120
Lead, St. Louis 15.80
Lead, New York 16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig 33.75
ingot 34.50
Magnesium, sticks, 100 to 500 lb. ... 56.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel electro 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. . $23 to $24
Platinum, dollars per troy oz. . $103 to $105
Silver, New York, cents per troy oz. 90.125
Tin, New York 96.125*
Titanium sponge, grade A-1, $2.70 to $3.00
Zinc, East St. Louis 13.50
Zinc, New York 14.00
Zirconium sponge $10.00
*Tentative.

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 35.50
No. 120 ..... 34.25
No. 123 ..... 33.25
80-10-10 ingot
No. 305 ..... 38.75
No. 315 ..... 37.00
88-10-2 ingot
No. 210 ..... 50.25
No. 215 ..... 46.50
No. 245 ..... 41.50
Yellow ingot
No. 405 ..... 28.75
Manganese bronze
No. 421 ..... 31.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 26.00-27.00
0.60 copper max. 25.75-26.75
Piston alloys (No. 122 type) . 25.50-26.00
No. 12 alum. (No. 2 grade) . . . 24.25-25.00
108 alloy 24.50-25.00
195 alloy 26.00-26.75
13 alloy (0.60 copper max.) . . 26.00-27.00
AXS-679 ..... 25.75-26.75

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 24.00-25.00
Grade 2—92-95% 23.25-24.25
Grade 3—90-92% 22.50-23.25
Grade 4—85-90% 22.00-22.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	36	35¼
Yellow brass	27¼	25⅛
Red brass	31⅞	31¼
Comm. bronze	33⅛	32⅜
Mang. bronze	25¼	24½
Yellow brass rod ends	27	....

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 33
No. 2 copper wire 31½
Light copper 29
*Refinery brass 29
* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 33
No. 2 copper wire 31½
Light copper 29
No. 1 composition 27½
No. 1 comp. turnings 27
Hvy. yellow brass solids 19
Brass pipe 19
Radiators 21

Aluminum

Mixed old cast ..... 15 —16
Mixed new clips ..... 16½—17½
Mixed turnings, dry ..... 16 —17

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 30 —30½
No. 2 copper wire ..... 27½—28
Light copper ..... 25 —25½
Auto radiators (unsweated) .. 17½—18
No. 1 composition ..... 23½—24
No. 1 composition turnings . . . 22½—23
Unlined red car boxes ..... 18½—19½
Cocks and faucets ..... 19 —19½
Clean heavy yellow brass .... 16 —16½
Brass pipe ..... 21 —21½
New soft brass clippings ..... 22½—23
No. 1 brass rod turnings .... 20 —20½

Aluminum

Alum. pistons and struts .... 7 — 7½
Aluminum crankcases ..... 12 —12½
1100 (2S) aluminum clippings 15½—16
Old sheet and utensils ..... 12 —12½
Borings and turnings ..... 8½— 9
Industrial castings ..... 12 —12½
2024 (24S) clippings ..... 13½—14

Zinc

New zinc clippings ..... 7½— 8
Old zinc ..... 4½— 5
Zinc routings ..... 2¾— 3
Old die cast scrap ..... 2½— 2¾

Nickel and Monel

Pure nickel clippings ..... $1.65-$1.90
Clean nickel turnings $1.50
Nickel anodes ..... $1.65-$1.90
Nickel rod ends ..... $1.65-$1.90
New Monel clippings 75-80
Clean Monel turnings 60-70
Old sheet Monel 65-70
Nickel silver clippings, mixed 21
Nickel silver turnings, mixed 18

Lead

Soft scrap lead ..... 12½—13
Battery plates (dry) ..... 7 — 7½
Batteries, acid free 4½

Miscellaneous

Block tin ..... 80 —81
No. 1 pewter ..... 62½—63
Auto babbitt ..... 42 —42½
Mixed common babbitt ..... 13 —13½
Solder joints ..... 18 —18½
Siphon tops 42
Small foundry type ..... 15¼—15½
Monotype ..... 14½—15
Lino. and stereotype ..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells ..... 10 —10½
Lino. and stereo. dross ..... 5¼— 5⅜
Electro. dross ..... 4¼— 4½

IRON AGE

STEEL PRICES

(Effective July 17, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.80 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.80 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.825 *B3*	9.10 *B3*		
	Claymont, Del.													13.45 *C11*
	Harrison, N. J.													
	Conshohocken, Pa.								4.775 *A2*	6.70 *A2*	6.825 *A2*			
	New Bedford, Mass.									6.70 *R6*				
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.80 *B3*							
	Boston, Mass.									6.80 *T8*				13.80 *T8*
	New Haven, Conn.									7.30 *D1* 6.70 *A1*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.10 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.80 *N7,A5*				13.80 *A5, N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*										13.45 *G4*
	Chicago, Ill.	$68.50 *U1*	$84.50 *R3, U1* 89.50 *W8*	$96.00 *R3, U1* $101.00 *W8*	5.45 *U1*	4.60 *U1,* 4.85 *W8*	6.74 *U1, Y1*	4.60 *U1*	4.725 *A1* 4.575 *W8* 4.325 *N4*	6.35 *A1,T8*			7.45 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D2,G3, M2,P11* 6.95 *D1*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *U1*	$84.50 *U1*	$96.00 *U1, Y1*	6.45 *I3*	4.60 *U1 I3*	6.75 *U1, I3*		4.325 *I3, U1,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, U1,Y1*	9.30 *Y1*	7.20 *Y1, U1*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.		$94.50 *C10*	$106.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *U1, J3*	$84.50 *J3, U1,C11*	$96.00 *U1, C11*	5.45 *U1*	4.60 *U1, J3*	6.75 *U1, J3*	4.60 *U1*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio			$96.00 *Y1, C10*			6.75 *Y1*		4.325 *U1, Y1*	6.25 *Y1,C5*	6.425 *U1, Y1*	9.30 *Y1*	7.20 *U1, Y1*	13.45 *C5*
WEST	Fontana, Cal.	$82.50 *K1*	$100.50 *K1*	$127.00 *K1*		5.30 *K1*	7.90 *K1*	5.90 *K1*	5.575 *K1*	8.70 *K1*	8.025 *K1*		9.65 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.30 *C7, B2*	7.45 *B2*		5.875 *C7 B2*	8.30 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles. Pittsburgh, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.875 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			5.10 *C16* 4.60 *R3,T2*	6.75 *T2*		4.325 *R3,T2* 4.825 *C10*		6.425 *T2*			
	Houston, Lone Star, Texas	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	

STEEL PRICES

(Effective July 17, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			5.375 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.775 *A2*	4.775 *A2*				6.825 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.375 *B3*			
	Fairless, Pa.	4.375 *U1*	5.375 *U1*				6.425 *U1*	7.925 *U1*				$9.70 *U1*	$8.40 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.475 *B3*	$9.70 *B3*	$8.40 *B3*	
	Worcester, Mass.										5.675 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.55 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.725 *A1* 4.575 *W8*					6.375 *U1*				5.375 *N4* 5.375 *A5,R3*			
	Sterling, Ill.										5.475 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.375 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.725 *N5*	5.925 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *I3, U1,Y1*	5.325 *I3, U1,Y1*	5.85 *U1, I3*	5.90 *U1, I3*	6.25 *U1*	6.375 *Y1, U1,I3*	7.875 *U1, Y1*			5.375 *Y1*	$9.60 *U1,Y1*	$8.30 *I3, U1,Y1*	6.65 *U1, Y1*
	Granite City, Ill.	4.95 *G2*	6.025 *G2*	6.65 *G2*	6.60 *G2*								$8.40 *G2*	7.25 *G2*
	Kokomo, Ind.			6.35 *C9*							5.825 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*								
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3,N3*	5.325 *R3, N3*	5.85 *R3* 6.85 *N3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*					$8.30 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, U1,P6*	5.325 *J3, U1,P6*	5.85 *U1*	5.90 *U1, A7*		6.375 *J3, U1*	7.875 *U1*	8.60 *U1*		5.625 *P6* 5.375 *A5*	$9.60 *J3, U1*	$8.30 *J3, U1*	6.65 *U1*
	Portsmouth, Ohio	4.725 *P7*	5.925 *P7*								5.725 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5,F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$9.60 *W3, W5*	$8.30 *W3, W5*	6.65 *F3, W5*
	Youngstown, Ohio	4.325 *U1, Y1*	5.325 *Y1*		5.90 *Y1*		6.375 *U1, Y1*	7.875 *Y1*			5.375 *Y1*			
WEST	Fontana, Cal.	5.575 *K1*	7.075 *K1*				7.625 *K1*	9.625 *K1*				$10.35	$9.05	$7.75
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.625 *S2*			
	Los Angeles, Torrance, Cal.										6.175 *B2*			
	Minnequa, Colo.										5.625 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.60 *C7*							5.675 *C7*	$10.35 *C7*	$9.05 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.025 *R3* 5.375 *T2*	$9.70 *T2*	$8.40 *T2*	
	Houston, Tex.										5.625 *S2*			

IRON AGE

STEEL PRICES

(Effective July 17, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.575 *B3*	7.425 *B3*	6.80 *B3*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	6.30 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.60 *W6*
	Claymont, Del.							5.35 *C4*		6.30 *C4*	6.725 *C4*	
	Coatesville, Pa.							4.80 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.95 *A2*	6.025		7.175 *A2*	
	Harrisburg, Pa.							5.10 *P2*	5.575 *C3*			
	Hartford, Conn.			6.75 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.60 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.70 *W10*		7.60 *W10*						
	Camden, N. J.			6.70 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.80 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.70 *B3*
	Palmer, Worcester, Readville, Mass.			6.70 *W11*		7.725 *A5,B5*		4.50 *R3*				6.90 *A5*
	Milton, Pa.	5.25 *M7*	5.25 *M7*	6.45 *C14* 6.70 *B5*								6.90 *W6*
	Spring City, Pa.			6.35 *K4*		7.60 *K4*						
MIDLE WEST	Alton, Ill.	4.85 *L1*										6.775 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N5*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		6.25 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E1*				
	Chicago, Joliet, Ill.	4.65 *U1,R3* 4.90 *W8* 5.15 *P13*	4.65 *N4,R3* 5.15 *P13*	6.25 *B5,W10, A5,L2* 6.50 *W8*	5.575 *U1,R3,* 5.825 *W8*	7.425 *A5, W10,L2,B5* 7.675 *W8*		4.50 *U1,I3,R3* 4.90 *A1* 4.75 *W8*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.60 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	6.25 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.60 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.60 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.45 *B5* 6.50 *P3* 6.10 *P8*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3, P8*	6.90 *G3*	4.60 *G3*			6.825 *G3*	
	Duluth, Minn.											6.60 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	6.25 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1,I3, Y1*	4.50 *I3, U1, Y1*	5.575 *I3*	6.30 *U1, Y1*	6.725 *U1, I2, Y1*	6.35 *M4*
	Granite City, Ill.							5.15 *G2*				
	Kokomo, Ind.											7.20 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.70 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		6.25 *C10*	6.25 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	6.25 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.60 *A5,J3, P6*
	Portsmouth, Ohio											7.10 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1,Y1, C10,R3*	4.65 *U1,Y1, R3*	6.25 *Y1, U1*	5.575 *U1,Y1, C10*	7.425 *Y1,C10, F2*	6.80 *U1,Y1*	4.50 *U1,Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.60 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.80 *K1*	5.35 *K1*		7.175 *K1*		7.95 *K1*	5.65 *K1*		7.70 *K1*	7.875 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.85 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.70 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.55 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.85 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.55 *C7* 7.55 *C6*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	5.15 *A8*	5.15 *A8*									6.80 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,R3* 5.15 *C16*	4.65 *T2,R3* 5.15 *C16*				6.80 *T2*	4.50 *T2,R3*			6.725 *T2*	6.60 *R3,T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.60 *S2*		6.40 *S2*	6.825 *S2*	6.85 *S2*

Steel Prices *(Effective July 17, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdeboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 hitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel *ko.*, Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Youngstown *R3*	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75								
Fontana *K1*	6.00	13.25	9.00	+9.25	11.50	+5.75	14.00	+4.00	14.50	+3.00	15.00	+2.50	16.50	+1.75								
Pittsburgh *J3*	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Sharon *M3*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Fairless *N2*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75								
Pittsburgh *N1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Wheatland *W4*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75								
Youngstown *Y1*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
Indiana Harbor *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75								
Lorain *N2*	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	4.00	+11.	10.50	+6.25	13.00	+3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Youngstown *R3*	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75								
Fairless *N2*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Fontana *K1*	10.50		14.50		16.50		17.00		17.50		18.00		18.50									
Pittsburgh *J3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Alton, Ill. *L1*	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75								
Sharon *M3*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Pittsburgh *N1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	305.0	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Wheeling *W5*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Wheatland *W4*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75								
Youngstown *Y1*	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75
Indiana Harbor *Y1*	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75								
Lorain *N2*	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	5.50	+8.50	13.00	+2.75	15.50	+0.25	20.50	4.75

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.60	T-1
18	4	1	—	5	2.305	T-4
18	4	2	—	—	1.765	T-2
1.5	4	1.5	8	—	.96	M-1
6	4	2	6	—	1.35	M-2
6	4	2	5	—	1.105	M-3

High-carbon chromium.. .77 D-3, D-5
Oil hardened manganese .42 O-2
Special carbon ..... .39 W-1
Extra carbon ..... .33 W-1
Regular carbon ..... .275 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b

	Cladding	Plate (*A3, J2, L6*) 10 pct	Plate (*A3, J2, L6*) 15 pct	Plate (*A3, J2, L6*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	30.30	33.15	36.05	32.50
	316	35.50	38.45	41.40	47.00
	321	32.00	34.85	37.75	37.25
	347	34.40	37.90	41.40	48.25
	405	25.80	29.60	33.35	.....
	410, 430	25.30	29.10	32.85	.....

CR Strip (*B9*) Copper, 10 pct, 2 sides, 42.15; 1 side, 33.40.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	9.00	8.60	.....
Armature	9.95	9.60	10.10
Elect.	10.55	10.20	10.70
Motor	11.55	11.20	11.70
Dynamo	12.45	12.10	12.60
Trans. 72	12.80	13.05	13.55
		Grain Oriented	
Trans. 65	13.35		
Trans. 58	13.85	Trans. 80	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.25
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9–15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	152	162	...	173	175	7.40	7.80
Aliquippa, Pa. *J3*	152	162	...	...	...	7.40	7.80
Atlanta *A8*	154	167	...	177	180	7.60	8.125
Bartonville *K2**	169	184	...	195	197	8.10	8.70
Buffalo *W6*	...	...	...	...	...	7.50	7.90
Chicago, Ill. *N4***	152	166	...	175	179	7.50	8.10
Cleveland *A6*	157	...	...	...	...	7.50	.....
Cleveland *A5*	...	...	...	...	...	7.40	.....
Crawfordsville *M4**	154	169	...	177	181	7.60	8.20
Donora, Pa. *A5*	152	162	...	175	175	7.50	7.90
Duluth *A5*	152	162	...	175	175	7.50	7.90
Fairfield, Ala. *T2*	152	162	...	175	175	7.50	7.90
Galveston *D4*	157	...	...	...	...	...	.....
Houston *S2*	157	170	...	...	180	7.65	8.05
Johnstown, Pa. *B3**	152	166	...	...	175	7.40	7.80
Joliet, Ill. *A5*	152	162	...	175	175	7.50	8.10
Kokomo, Ind. *C9*	169	180	...	195	193	8.10	8.50
Los Angeles *B2**	...	...	...	...	...	8.35	8.925
Kansas City *S2*	157	167	...	178	180	7.65	8.05
Minnequa *C6*	157	167	162	178	180	7.65	8.05
Monessen *P6*	152	162	...	...	...	7.40	7.80
Moline, Ill. *R3*	...	162	162	...	...	...	.....
Pittsburg, Cal. *C7*	171	185	...	199	195	8.45	8.85
Portsmouth *P7*	...	...	...	...	...	8.00	.....
Rankin, Pa. *A5*	152	162	...	...	175	7.40	7.80
So. Chicago *R3*	152	162	157	173	175	7.40	7.80
S. San Francisco *C6*	...	...	...	197	195	8.35	8.75
Sparrows Pt. *B3**	154	...	...	175	181	7.60	8.20
Struthers, O. *Y1*	...	...	...	...	...	7.50	8.00
Worcester *A5*	158	...	...	...	...	7.70	8.20
Williamsport, Pa. *S5*	...	...	160	...	...	...	.....

Galvanized products computed with zinc at 5¢ per lb Exceptions: *zinc at 12.5¢ per lb; ** 13¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bristol, Conn. *W12*	.....	.....	10.90	13.05	15.75
Buffalo, N. Y. *R7*	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. *S9*	...	9.05	10.60	12.75	15.35
Cleveland *A5*	7.10	9.05	10.60	12.75	15.45
Detroit *D1*	7.20	9.15	10.70	12.85	.....
Detroit *D2*	7.20	9.15	10.70	...	.....
Harrison, N. J. *C11*	...	...	10.90	13.05	15.75
Indianapolis *C5*	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. *B4*	7.00	8.95	10.50	12.65	.....
New Haven, Conn. *D1*	7.55	9.35	10.90	13.05	.....
Pawtucket, R. I. *N7*	7.65	9.35	10.90	13.05	15.75
Pittsburgh *S7*	7.10	9.05	10.60	12.75	15.45
Riverdale, Ill. *A1*	7.20	9.65	10.60	12.75	15.45
Sharon, Pa. *S1*	7.10	9.05	10.60	12.75	15.45
Trenton *R4*	...	...	...	...	.....
Wallingford *W1*	7.55	9.35	10.90	13.05	15.75
Warren, Ohio *T4*	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. *W3*	7.10	8.95	10.50	...	.....
Worcester, Mass. *A5*	7.65	9.35	10.90	13.05	15.75
Youngstown *C5*	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	32.09	37.37	29.93	.....
	2½	12	43.22	50.31	40.31	.....
	3	12	49.90	58.10	46.55	.....
	3½	11	58.26	67.83	54.34	.....
	4	10	77.36	90.07	72.17	.....
National Tube	2	13	32.09	37.37	29.93	.....
	2½	12	43.22	50.31	40.31	.....
	3	12	49.90	58.10	46.55	.....
	3½	11	58.26	67.83	54.34	.....
	4	10	77.36	90.07	72.17	.....
Pittsburgh Steel	2	13	32.09	37.37	.....	.....
	2½	12	43.22	50.31	.....	.....
	3	12	49.90	58.10	.....	.....
	3½	11	58.26	67.83	.....	.....
	4	10	77.36	90.07	.....	.....

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery Charge **	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (10 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As Rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Baltimore	$.10	7.31	8.32	8.37	7.65	.....	7.63	7.93	7.61	8.62	14.38	13.44–13.96	16.36	16.29–16.49
Birmingham	.15	6.80–7.63	7.93–8.50	8.85	7.06–7.71	.....	6.99–7.95	7.28–7.93	7.08–7.77	9.35	.....	.....	.....	.....
Boston	.10	8.22–8.72	9.17–9.42	10.42–10.92	8.31–8.81	.....	8.51–9.01	8.37–8.87	8.37–8.81	9.96–10.46	14.81	13.76–14.26	17.61	16.81–17.31
Buffalo	.15	7.85	8.65	10.66	8.00	.....	8.30	8.25	8.00	8.55	14.70	14.15	17.50	17.20
Chicago	.15	7.78	8.64	9.75	7.86	9.55	8.10	8.08	7.92	8.40	14.35	13.80	17.15	16.85
Cincinnati	.15	7.90	8.63	9.75	8.10	.....	8.39	8.55	8.16	8.80	14.60	14.05	17.40	17.10
Cleveland	.15	7.28–7.78	8.39–8.64	9.10–9.60	7.46–7.96	.....	7.77–8.27	7.91–8.41	7.48–7.98	8.15–8.65	13.41–14.41	13.36–13.86	16.26–17.20	16.41–16.91
Denver		8.60	10.76	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.15	7.97	8.83	10.03	8.14	.....	8.38	8.55	8.20	8.69	14.59	14.04	17.39	17.09
Houston		7.85	8.75	10.49	8.15	.....	8.00	8.20	8.25	10.10–9.95	14.35	15.90	17.15	17.05
Kansas City	.20	8.45	9.31	10.42	8.53	.....	8.77	8.75	9.12	9.32	15.02	14.47	17.82	17.52
Los Angeles	.10	8.25	10.10	11.10	8.60	.....	8.85	8.40	8.25	11.00	.....	14.50	.....	18.10
Memphis	.10	8.10	8.96	.....	8.18	.....	8.42	8.40	9.05	9.65	.....	.....	.....	.....
Milwaukee	.15	7.37–7.87	8.48–8.73	9.34–9.84	7.45–7.95	.....	7.69–8.19	7.75–8.25	7.51–8.01	8.09–8.59	14.54	13.39–13.89	17.24	16.44–16.94
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.55	.....	.....	.....	.....
New York	.10	8.38	9.23	10.23	8.88	.....	8.81	8.71	8.67	10.37	14.72	14.17	17.52	17.22
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.44–7.94	8.54–9.04	9.51–10.01	8.09–8.59	.....	7.82–8.32	7.85–8.35	8.33	8.62–9.12	14.50	13.45–13.95	17.30	16.50–17.00
Pittsburgh	.15	7.78	8.89	10.05	7.96	9.50**	8.10	8.08	7.92	8.65	14.35	13.80	17.15	16.85
Portland		7.80–8.60	8.80–10.15	10.65	8.00	7.95	7.75	7.85–8.15	7.95	12.20	.....	15.00	.....	17.50
Salt Lake City	.20	8.60	10.15–10.60	.....	9.35	.....	.....	8.15–9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.30	9.75	10.25	8.45	.....	8.40	8.35	8.25	11.55	.....	14.50	.....	18.10
Seattle	.00	8.75	10.50	10.90	8.90	.....	8.50	8.50	8.60	12.25	.....	14.75	.....	17.80
St. Louis	.15	8.07	8.93	10.04	8.15	.....	8.39	8.48	8.21	8.94	14.64	14.09	17.44	17.14
St. Paul	.25	8.48	9.18	10.45	8.56	.....	8.80	8.78	7.74	9.35	15.05	14.50	17.85	17.55

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions. (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.35 delivery.

*Plus analysis charge. ‡Deduct for country delivery.

** F.O.B. Plant, warehouse price.

(Effective July 17, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	4.725	5.65	5.825	....	....	....	....
So. Chicago *R3*	....	....	....	8.05	....	....	....
Ensley *T2*	4.725	5.65	....	....	....	....	....
Fairfield *T2*	....	5.65	....	8.05	....	5.625	....
Gary *U1*	4.725	5.65	....	....	....	5.625	....
Ind. Harbor *I3*	4.725	....	5.825	8.05	....	5.625	....
Ind. Harbor *Y1*	....	....	....	8.05	....	....	....
Johnstown *B3*	....	5.65	....	....	....	....	....
Joliet *U1*	....	....	5.825	....	....	....	....
Kansas City *S2*	....	....	....	7.90	....	....	....
Lackawanna *B3*	4.725	5.65	5.825	....	....	5.625	....
Lebanon *B3*	....	....	....	....	....	....	12.15
Minnequa *C6*	4.725	6.15	5.825	7.90	....	5.625	12.15
Pittsburgh *O1*	....	....	....	....	11.90	....	12.15
Pittsburgh *P5*	....	....	....	....	....	....	12.15
Pittsburgh *J3*	....	....	....	8.05	....	....	....
Seattle *B2*	....	....	....	8.40	....	5.775	12.65
Steelton *B3*	4.725	....	5.825	....	....	5.625	....
Struthers *Y1*	....	....	....	8.05	....	....	....
Torrance *C7*	....	....	....	....	....	5.775	....
Williamsport *S5*	....	5.65	....	....	....	....	....
Youngstown *R3*	....	....	....	8.05	....	....	....

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50
Foundry, beehive (f.o.b. oven)	
Foundry, oven coke	
Buffalo, del'd	$28.75
Chicago, f.o.b.	27.00
Detroit, f.o.b.	27.50
New England, del'd	28.55
Seaboard, N. J., f.o.b.	26.75
Philadelphia, f.o.b.	26.50
Swedeland, Pa., f.o.b.	26.50
Painesville, Ohio, f.o.b.	27.50
Erie, Pa., f.o.b.	27.50
Cleveland, del'd	29.43
Cincinnati, del'd	28.59
St. Paul, f.o.b.	26.50
St. Louis, f.o.b.	28.50
Birmingham, f.o.b.	25.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.75	17	72	10.35
7	60	24.50	14	72	10.85
5	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	62.92
Electrodeposited	50.28
Brass, 80-20, ball anodes, 2000 lb or more	60.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon	90.50
(rolled depolarized add 3¢ per lb)	
Cadmium	$1.70
Tin, ball anodes and elliptical	$1.06 to $1.10

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	80.50
Copper sulphate, 5 or more 100 lb bags, per cwt	21.15
Nickel salts, single, 4-100 lb bags	33.25
Nickel chloride, freight allowed, 300 lb	43.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	21.55
(Philadelphia price 21.80)	
Zinc cyanide, 100 to 900 lb	56.55
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 1 to 20 100 lb drums	30.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts Full case	Full case 20,000 lb Quantity or more
½ in. & smaller x 6 in. & shorter	61	63
Larger than ½ in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex, HP, reg. & hvy.

¾" or smaller	64	66
⅞" to 1 1/16" inclusive	63	65
1 1/16" to 1 ½" inclusive	65	67
1 5/8" and larger	61	63

C.P. Hex, regular & hvy.

¾" or smaller	64	66
⅞" and larger	61	63

Hot Galv. Nuts (all types)

1½" or smaller	44	47

Finished, Semi-finished, Hex Nuts

¾" and smaller	66	66
⅞" and alrger	63	63

Add 25% for less than case or keg quantity.

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount Bright	H.C. Heat
New std. hex head, packaged		
¼" thru ½" diam. x 6" and shorter	34	20
9/16" and ⅝" x 6" and smaller and shorter	31	16
¾", ⅞", 1" x 6" and shorter	9	+11
¼" thru ½" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	43	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
Quantity		
¼-in. diam. & under — 25,000-200,000	20	61
5/16-in. diam. & larger — 15,000-100,000	20	61
All diam. over 3 in. long — 5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

	Discount Hex	Square
Packaged, package list	24	27
Bulk, bulk list		
Quantity		
¾-in. diam. & smaller — 25,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	113.1
New York	125.6
Chicago	127.5
San Francisco-L. A.	134.8

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$122.00
No. 1 Ohio	....
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$128.00
Childs, Hays, Pa.	138.00
Chicago District	138.00
Western Utah	144.00
California	151.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O.	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	32.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$91.00
Standards chemically bonded, Curtiner, Calif.	101.25
Burned, Balt.	85.00

Magnesite Brick

Standard Baltimore	$114.00
Chemically bonded, Baltimore	102.00

Grain Magnesite

St. ¾-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed	64.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	40.00
in sacks	46.00

Dead Burned Dolomite

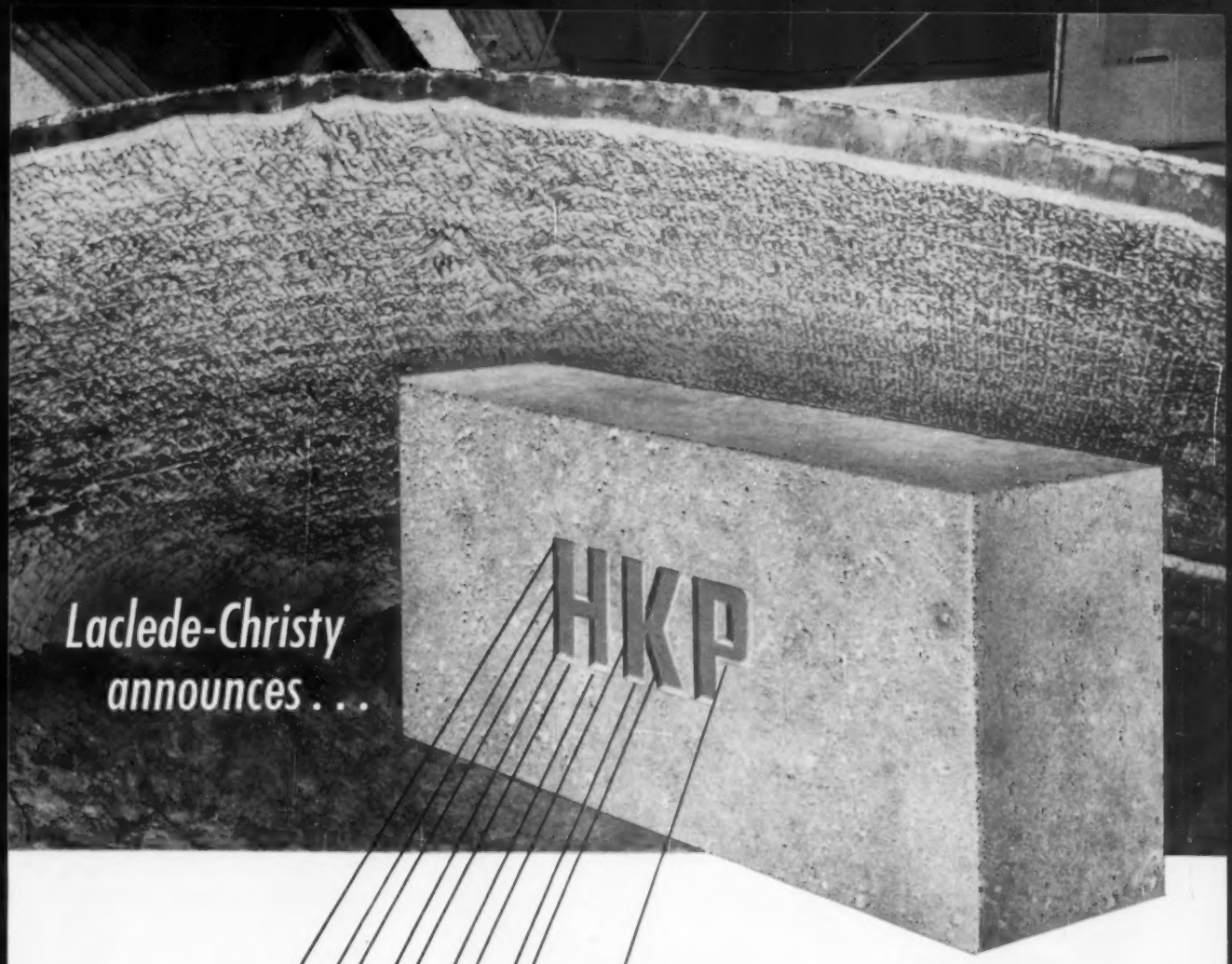
Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$15.00
Midwest	15.60
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron c.i.f. New York, ocean bags	9.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe	.86.0¢ to $1.55
Aluminum freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd	$5.00
Lead	.8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	$3.00 to $3.25
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	.7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	.14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	.18.75¢ to 32.50¢



Laclede-Christy announces . . .

a new super-duty SILICA BRICK

HKP

New Laclede HKP Silica Brick has just set roof life records in Open Hearth furnaces of 224 heats and 225 heats in two recent campaigns—both all-time records. *Annual roof life records* show that HKP Silica Brick exceeds other super-duty silica brick by as much as 17% on 250 ton and 285 ton furnaces!

Can you afford to overlook this kind of service and savings? Call your Laclede-Christy representative for prompt action.

LACLEDE-CHRISTY DIVISION

H. K. PORTER COMPANY, INC.

St. Louis 10, Missouri

Ferroalloy Prices

(Effective July 17, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C ...	39.25	0.20% C ...	36.25
0.03% C ...	38.75	0.50% C ...	36.00
0.06% C ...	37.25	1.00% C ...	35.25
0.10% C ...	36.75	1.50% C ...	35.10
0.15% C ...	36.50	2.00% C ...	35.00

4.00-4.50% C, 67.70% Cr, 1-2% Si... 26.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 25.00
0.025% C (Simplex) 32.50
0.10% C, 50-52% Cr, 2% max Si.... 33.75
8.50% max. C, 50-55% Cr, 3-6% Si.. 23.50
8.50% C, 50-55% Cr, 3% max Si.... 22.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.27
0.50% max. C	1.27
9 to 11% C, 33-91% Cr, 0.75% Fe..	1.36

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅛" thick) delivered packed. 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	1.25
Ton lots	1.27
Less ton lots	1.29

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	41.85
Ton lots	46.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	23.00
Ton lots	26.75
Less ton lots	28.25

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe ½ in. x 12 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19½ Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.: Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.75
Johnstown, Pa.	10.75
Sheridan, Pa.	10.75
Philo, Ohio	10.75
S. Duquesne	10.75

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.00
Ton lots packed	15.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$92.00
19 to 21%	3% max.	94.00
21 to 23%	3% max.	96.50

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	31.5
Ton lots	33.5
250 to 1999 lb	35.5
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 22.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	34.00	36.55	37.75
0.07% max. C	31.95	34.50	35.70
0.10% max. C	31.20	33.75	34.95
0.15% max. C	30.45	33.00	34.20
0.30% max. C	28.95	31.50	32.70
0.50% max. C	28.45	31.00	32.20
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	25.45	28.00	29.20

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carload bulk	12.00
Ton lots	13.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	13.55
Ton lots, packed	15.75

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe ...	22.75	21.45
98% Si, 1% Fe	23.25	21.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si. briquets.

Carloads, bulk	7.15
Ton lots, packed	9.75

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bluk, carloads, f.o.b. shipping point.

50% Si ...	12.75	75% Si ...	15.40
65% Si ...	14.50	85% Si ...	17.10
		90% Si ...	18.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b Langeloth, Pa., per pound Contained Mo $1.34

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.65

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $200.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, delivered $3.45

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.32
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.30

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	17.50¢
Ton lots, packed lump	19.50¢
Less ton lots	20.00¢

Vanadium oxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.32

Zirconium contract basis, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	26.25¢
12-15%, del'd lump, bulk-carloads	8.50¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3.14%, Si 40-45%, per lb contained 2 .... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots 1.20
F.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese - Boron, 75.00% Mn., 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D. del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.05

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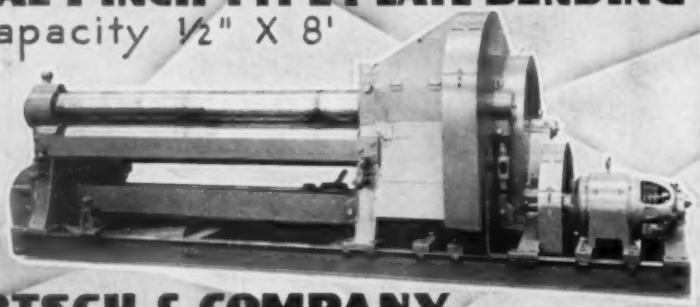

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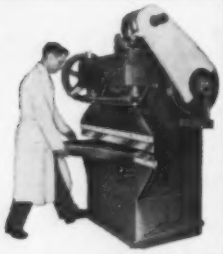

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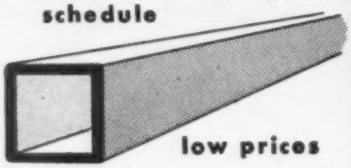

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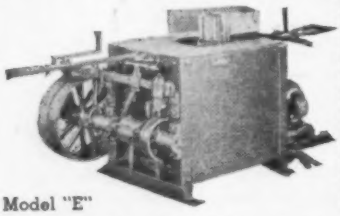

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Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".

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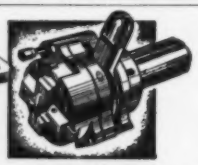

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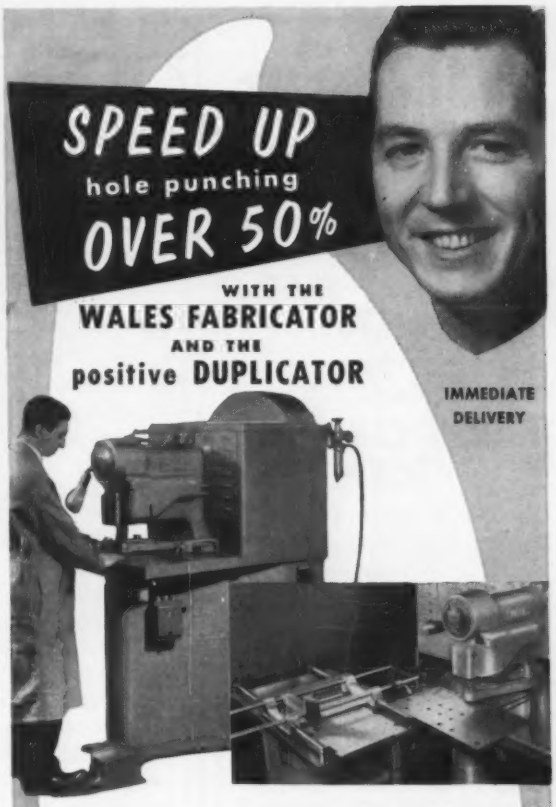

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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Summer Slowdown . . . A combination of the normal summer slowdown in tool business, plus a stronger trickle of used tools for sale out of Detroit, has brought the activity of used tool dealers in the Middle West down somewhat from the racehorse pitch of one month ago.

A few dealers are willing to admit that they've begun building inventory slightly, though this is by no means general, and an even smaller segment feel that they can now slow down on their own buying and enjoy the hot months.

But despite the slower summer pace, and in some cases it was noticeable as much as four weeks ago, it is difficult to find a dealer in the Chicago area who can say that business is bad. Even dealers who have suffered the sharpest cutback in their mid-summer operations number among their ranks a considerable group who regard their current inventory as light, and feel that with a September business pickup, they'd be scratching harder for additional equipment in third quarter than they were in second. And second quarter was a very tough period for locating used tools for resale.

Better Than Korea? . . . Again, despite the comments that business has fallen, a sampling of smaller dealers produced about a 100 pct total who felt that the year 1956 total sales would establish records for their particular shops. Heretofore, the red-hot used tool demand experienced during the Korean War has been regarded as a high point, but it is finally beginning to appear that 1956 could make the extremely high volume business levels of that period obsolete.

One of the leaders in the falloff has been screw machines, which not much over a month ago were still an extremely strong item. Centerless grinders have been noticed by a number of dealers as another temporarily weak item. Sheet metal working equipment, particularly for shipment out of the immediate Chicago area, has been slightly less noticeable in its dropoff than most other tool lines, and has been considerably more difficult to stock for the same reason.

In short, the summer slump is about what is expected for the season and certainly is not regarded as a barometer of stormy business periods ahead. Through the entire period there has been a strong level of demand for heavier equipment; radial drills, horizontal and vertical lathes, boring mills, have continued in strong demand, low supply, and strong in price.

Some Price Cuts . . . Price cutbacks of as much as 15 pct on screw machines are reported, but price cutbacks are by no means widespread and auction sale prices, despite minor recession, have continued at an extremely high level as they did through all of second quarter. It's worth noting that attendance at auctions has continued high, arguing that whatever may be the current business level, there exists a real need to beef up floor stocks of tools among used machine tool dealers and their customers.

It's felt that the Detroit slowdown has had some effect in checking the steady rise in used tool prices, but certainly has done little to throw a large number of tools on the market.

It's felt, too, that the first half of July will probably be the lowest point in tool sales, simply because of the number of plant vacation shutdowns that are beginning to concentrate in that period, and that even later July will see some fresh inquiries coming in. With a lot of defense work still to come, with used tools in dealers' inventories certainly not excessive, the outlook is for a brisk fall season.

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5 ton Shepard Niles	55' Span 220 Volt D.C.
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5 ton Cleveland	90' Span 230 Volt D.C.
10 ton Cyclops	40' Span 220/440 A.C.
10 ton P&H	77' Span 230 Volt D.C.
10 ton P&H	96' Span 220 Volt D.C.
50 ton Hand Oper.	100' Span
120 ton Whiting	80' Span 220/3/60 A.C.

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For cold reducing 7" wide strip
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SHEAR—ANGLE
6 x 6 x ⅝" Cleveland
SHEARS—SQUARING
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12' x ¾" Steelweld
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1	500	Cr. Wh.	720	575/600	2300/440
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1	200	Elliott	1200	125	4000/2300
8	150	G.E.	1200	250	2300/440
1	120	Whse.	1200	250	2300/440
1	100	Al. Ch.	1200	250	4000/2300

LARGE MILL TYPE MOTORS

Qu.	HP	Make	R.P.M.	Volts	Type
1	3000	Whse.	600	525	Tandem
1	1500	Whse.	600	525	Rev.
1	700	Al. Ch.	135	230	Mill
3	600	Al. Ch.	300/600	230	Mill
3	600	Whse.	110/230	230	Mill
1	450	Whse.	450/600	230	BK
1	300	Whse.	300	230	Mill
4	275	Whse.	435/850	230	QM-600.6
1	150	Whse.	360/720	600	QM-666.8

SLIP RING MOTORS
Constant Duty 3 Phase 60 Cycle

Qu.	HP	R.P.M.	Make	Type	Volts
1	100	420	Al.Ch.		440/220
2	100	495	G.E.	1-15A-M	2200
1	100	900	E. Dy.		2200
1	100	1200	Whse.	CW	440/220
1	104	870	Whse.	CW	440/220
1	125	600	G.E.	I-14-M	2200
1	150	450	Whse.	CW-1000	440
1	150	496	Whse.	CW	440/220
1	150	585	Whse.	CW	4160/2300
1	150	720	Al. Ch.	ARY	440/220
1	200	425	G.E.	I-M	440
1	200	490	G.E.	I-14-M	2200
2	200	585	G.E.	I-12-M	2300
1	250	300	G.E.	MT-414	2200
1	250	720	Al. Ch.	ARY	440
1	250	360	Whse.	CW	2300
1	400	360	G.E.	MT-424	2300/440
1	400	505	Al. Ch.	ARY	2200
1	425	592	G.E.	I-M	440
1	450	440	Whse.	CW	2200
1	450	514	G.E.	I-M	2300
1	500	450	G.E.	I-M	2300
1	500	514	Al. Ch.	ANY	2300
1	700	295	Whse.	CW	2200
1	750	400	G.E.	I-M	2300
1	1000	445	Whse.	CW	2300
1	1250	593	Whse.	CW	6600
1	1500	360	G.E.	MT	2300
1	1800	270	Whse.	Mill type	6600
1	2500	257	G.E.	Mill type	6600

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#3 Abramson Bar & Tube Straightener
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10' x 1" Long & Allstatter Plate Shear
Hilles & Jones and Buffalo Shears 1½", 2", 2½", 3", 3¼", 4" and 4¼"
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4000# Niles Bement Double Frame Steam Forge Hammer
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Nazel Air Forging Hammers, #2-B, 4-B, 5-N
Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U-type
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Multiple Punches
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ELECTRIC POWER EQUIPMENT
D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	1200	G.E.	MCF	600	650/800
1	1000	G.E.	MCF	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		250	450/550
1	500	Whse.	CC-216	600	300/900
1	500	G.E.	MCF	230	250/750
8	450	Whse.		550	415
1	250	G.E.	MPC	230	400/600
1	200	G.E.	CD-1650Z	230	500/1500
1	200	Whse.	CB-5113	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
2	150	Cr. Wh.	83H-TEFC	230	890
1	150	Whse.	SK-151B	230	900/1800
1	150	Whse.	SK-201	230	300/950
1	120	G.E.	MCF	230	250/1000
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
2	75	C.W.	53H-TEFC	230	860
1	50	G.E.	MD-412AE	230	550
1	50	Whse.	SK-131.5 B.B.D.P.	230	600/2200

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	3000(3U)	G.E.	514	600	4000/6900/ 13200
2	2000/2400	G.E.	450	250/300	2300/4600
1	1750/2100	G.E.	514	600	4000/6900/
1	2000	G.E.	500 25cy	660	11000
1	2000	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1250	Whse.	720	600	2300
1	750	Whse.	900	250	2300/4600
1	500	Whse.	900	125/250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	3000	A.C.	OISC	3	33000x2300
1	2500	A.C.	Furnace	3	13800x147/113.5
1	2500	A.C.	OISC	3	34520x13800
3	1666	G.E.	HVDDJ	1	2400x438
6	1000	Wagner	OISC	1	13200x460
3	667	G.E.	HD	1	13800x2300
3	500	Kuhl	OISC	1	13200x6600
3	333	G.E.	HS	1	7200x2400/4160Y
3	333	G.E.	HD	1	13200x2300
3	333	G.E.	HSWR	1	2300/4000x230/460
1	300	G.E.	HT	3	4160x480/277
3	200	Whse.	OISC	1	13200x120/240
3	200	G.E.	HKS	1	4800/2400x230/460

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No. 74 Heald hyd. pl. internal, X-sliding H. S., 1941.
12" x 24" Cincinnati ER hyd. universal cyl. serial 2U3B1H-5.
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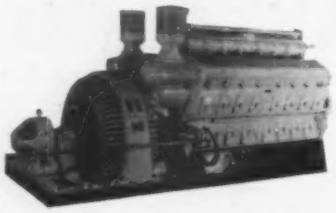

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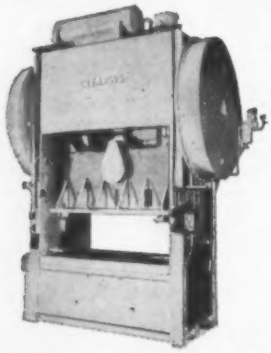

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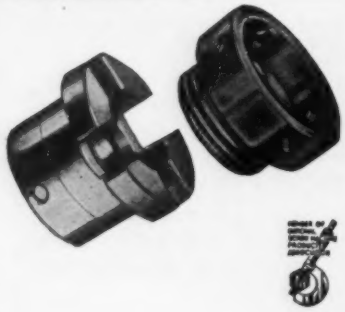

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Get Ready for Model Changeovers

Ford Motor Co. set the new model changeover pattern, announcing that shutdowns for the 1957 model change will start in the last week in July. The downtime period, starting earlier than usual, will also take longer, winding up in mid-September. The longer period is required by an extensive change, in contrast to last year's facelifting.

Renegotiation Approved by Congress

Driving for adjournment, Congress is on the verge of extending a modified version of the renegotiation act for another two years. The House has approved a two-year extension which would soften the wartime "emergency" legislation by exempting contracts under $1 million, and contracts for "standard commercial articles."

Steel to Russia Authorized

The government is permitting an unidentified American businessman to ship 7800 tons of cold-rolled, dull surface sheet steel to a Russian auto factory. The export license was approved May 15 on the basis that sheet is not on the "positive list" of controlled commodities. It is not known if the steel was actually shipped and Commerce Dept. refuses to identify the selling firm.

Republic Orders Slabbing Mill

United Engineering and Foundry Co., Pittsburgh, has received an order from Republic Steel Corp. for a 45 in. x 90 in. universal slabbing mill. It will be installed at the Corrigan-McKinney works, Cleveland. It will handle ingots up to 47,000 lb.

Auto Supplier Diversifies

Kelsey-Hayes Wheel Co., a major supplier of auto wheels, will purchase outstanding stock of Utica Drop Forge & Tool Corp., Utica, N. Y. The Detroit wheelmaker said the New York concern will be operated as a wholly-owned subsidiary.

Extrusion Press Field Widens

Birdsboro Steel Foundry & Machine Co. has completed first of four extrusion presses for Kaiser Aluminum & Chemical Corp.'s Halethorpe, Md., plant. The $1 million order is the first for Birdsboro in the extrusion press field.

New Developments in Fuel Injection

American Bosch Arma Corp. and Thompson Products, Inc., have entered into agreement to develop, promote and manufacture automobile fuel injection systems in volume production.

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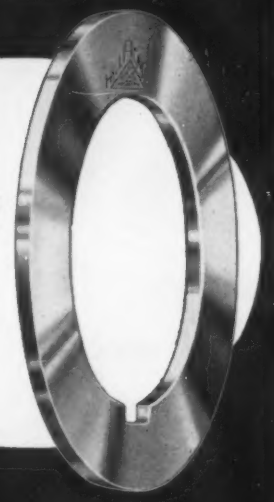
"CLEVELAND"

Rotary Slitting and Side Trimmer Knives



It's the quality of the tool steel plus 40 years of "Know How" that insure CLEVELAND KNIFE users of complete satisfaction. "CLEVELAND" Knives are made in "Alloy", "Century", "Peerless" and "High Speed" grades to meet every metal cutting condition.

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Concentrated Heat for Industry*

Scientists and engineers have done a tremendous amount of work, over the past 10 years, with new techniques in burning fuels. Most of their work has been aimed at the goal of making airplanes and rockets fly faster. Now, as this illustration shows, industry is picking up some of the techniques for its own use.

and smaller area can pay off in the operations of several industries. But a... it stands, a jet turbine's ... too rich for a pl... bine's f...

...built around *Carpenter* Stainless Tubing for Long Life!

This unique type compact heat exchanger has found ready acceptance as a highly efficient and dependable source of hot air or gas at pressures up to 300 psi and temperatures to 1200°F. Carpenter Stainless Tubing met every requirement of the manufacturer—superior strength at high pressures and temperatures, easy fabrication, uniform expansion, oxidation resistance and long, maintenance-free performance. That's why Carpenter Stainless Tubing is used exclusively for the straight tube and coiled fin-tube bundles, both shown at right partially assembled.

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Stainless Tubing & Pipe

*from BUSINESS WEEK of January 22, 1955

OVER 20,000 BEARINGS ARE LUBRICATED AT FAIRLESS WORKS BY Trabon LUBRICATION SYSTEMS

PHOTOS COURTESY U. S. STEEL CORPORATION

The following wide range of equipment at U. S. Steel's new Fairless Works is lubricated around the clock by TRABON *positive* centralized lubricating systems: Wellman Ore Bridge; E. W. Bliss Hi Scale Breakers; Arthur G. McKee Blast Furnaces; Atlas Ore Transfer Cars; Wean Combination Line; Alliance Cranes; Cleveland Cranes; American Bridge Cranes; Wellman Charging Machines; Dravo Ore Unloaders; E. W. Bliss 80″ Pickle Line; Mesta 45″ Slabbing Mill; Mesta 80″ Hot Strip Mill; Morgan 10″ Merchant Mill; Continental 40″ Blooming Mill; United Billet Mills; Morgan Scale Yard Crane; E. W. Bliss Cold Mills.

This installation of TRABON systems, automatic and manual, assures each bearing point accurate lubrication as frequently as it is required.

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Trabon

ENGINEERING CORPORATION

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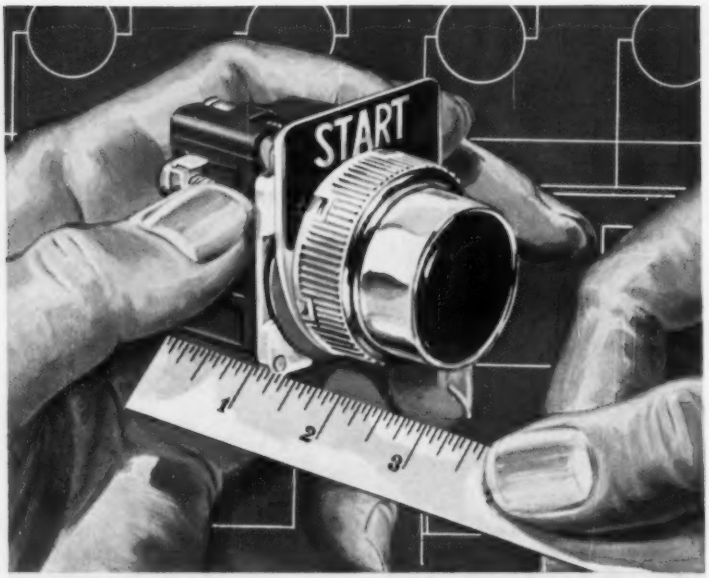
Oil and Grease Systems

Now...for machinery designers...new heavy duty pushbutton units built to the standards of the spectacular new Cutler-Hammer Three-Star Motor Control



These are the world's smallest heavy duty pushbuttons. They require a behind-the-panel depth of only 1 3/32". This is 40% less space than needed by the next smallest units on the market. Double-pole contact blocks are available in all combinations of normally open and normally closed contacts. Each control circuit is electrically and mechanically isolated from the other. Each circuit is clearly identified and all terminals are color coded. Rapid on-the-job circuit additions are obtained by stacking contact block on contact block.

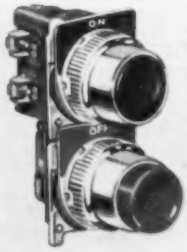
☆ *they install easier*

☆ *they work better*

☆ *they last longer*

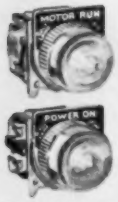
Design engineers are quick to recognize that these new heavy duty pushbuttons have *everything*. There is nothing on the market like them. They are amazingly compact to require the least back-of-panel depth. They are one-hole mounting and they are oil tight. They easily provide for as many as eight separate control circuits per pushbutton, eight completely isolated heavy duty contacts either normally open or normally closed. The buttons may be flush type, the extended type or with mushroom heads. They can be black, red, yellow, green or gray. See the new one-button control station, C-H Roto-Push. See the easiest-to-install maintained-contact pushbutton attachment and the means for padlocking any of the standard pushbuttons. There are both knob and key operated selector switches in this complete line. Also matching indicating lights and the new automation safety light, PresTest. Be sure you have complete information *now*. Write today on your company letterhead for a copy of the new Cutler-Hammer Panel Builders Handbook Pub. EE-120. CUTLER-HAMMER, Inc., 1325 St. Paul Ave., Milwaukee 1, Wisconsin.

These pushbuttons may be flush type, extended type or with mushroom heads . . . in a wide range of colors for quick control identification. Standard, large, and jumbo size legend plates fit every type of operator and indicating light in the entire line.

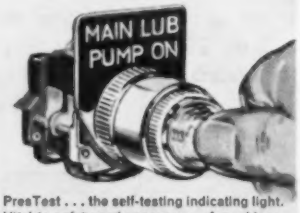


A maintained-contact pushbutton assembly that saves more than its entire cost by installation savings. New attachment with its pushbuttons mount in minutes; no fussy adjustments. Neither alignment nor spacing of units is critical. Pushbuttons will not bind or stick; always operate perfectly.

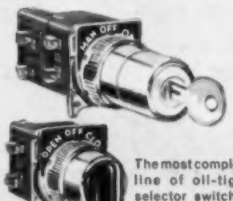
CUTLER-HAMMER
☆ ☆ ☆
MOTOR CONTROL
C-H



The C-H one-hole mounting oil-tight indicating lights with new wide-visibility lenses are the most visible from all angles by actual light meter tests. Available in either transformer or resistor types. Lenses offered in six different colors.



PresTest . . . the self-testing indicating light. Vital to safety and proper use of machines, particularly in automation. PresTest now permits instant proof light is NOT off because of burned-out bulb. Merely pressing on the light lens disconnects bulb from its normal circuit and checks it on a test power supply. Resistor and transformer types available.



The most complete line of oil-tight selector switches on the market. Key or knob operated; two or three position. Positions may maintain contact or have spring return. Three standard contact blocks provide a wide range of circuit combinations with the use of just a single block. Unlimited circuitry by adding blocks.

Roto-Push . . . the one-button control station. One Roto-Push can provide all the control functions for which two or three separate pushbuttons would be used normally. Available in a wide range of selector and button operators, Roto-Push simplifies panel design and saves installation time to cut costs. Improves machine-operator efficiency.